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JOURNAL of the american dietetic association

The Journal of The American Dietetic Association is published monthly by The American Dietetic Association, Mount Morris, Illinois. Neither the Association nor the Editor assumes responsibility for the opinions expressed by authors of papers abstracted, quoted, or published in full in this Journal.

Subscription Rates: $8 per year in advance in the U.S., Canada, and countries of the Postal Union; all other countries, $9 per year in advance. Special rate to undergraduate students and dietetic interns in approved internships, $2 per year in advance. All correspondence concerning Journal subscriptions, orders for copies, or reprints from the Journal, and notices of change of address should be sent to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Notices regarding change of address should reach the publisher by the *5th of the month before the date of issue* on which the change is to take effect and both old and new addresses *must* be given. Claims for Journals lost in the mail will not be entertained more than six months after the date of the issue involved.

Editorial Correspondence: All articles and notices for publication, general correspondence, and inquiries should be sent to the Editor at The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Manuscripts are accepted for publication on condition that they are contributed solely to the Journal. Copy must be double-spaced and two copies, an original and one carbon, submitted.

Advertising: All correspondence concerning advertising should be addressed to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois.

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Blazing New Trails in Thinking[1]

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Imagination and "creativity" need not remain the sole preserve of the artists, poets, dreamers, and children. They are traits of thinking which can be cultivated by administrators and executives, to the benefit of their entire organizations. Gimmicks, such as "brainstorming," described here, can help develop the habit of creative thinking.

THE AIR FORCE, which has a tradition of making routines of miracles, is already preparing for the unimaginable. What you read in the papers is astonishing enough, but it is already history. Today is never like yesterday, and the only thing that always remains the same is change.

Thus those of us who work for the Air Force have had to learn something about change and how to live with it. And, we've had to try to teach our young officers—and some of the older ones, too—how to cope with change, how to adapt to change, and how to create change. In the Air Force ROTC, we give a 20-hr. course for just this purpose; it is called "Creative Problem Solving." I'd like to pass on to you some of the things we've had to learn to teach that course.

The real bottle-neck to rapid progress is not lack of technical know-how or production capabilities. The factors which now stand out as the greatest deterrents to progress in military air operations—and these factors are equally present in all trades and professions—are *mental rigidity*, the tendency to cling to *old, outmoded routines*, obsolete *policies* (mostly unwritten), just plain *habit*, and the pressures of *conformity*.

Our progress in the development of scientific facts or devices, such as the modern bomber or missile, medical machinery or medication, or in food processing and packaging, has *far outstripped* our progress in the development of ways of using the human mind to cope with such new developments. We do not need a crystal ball to help us predict that this problem will grow worse instead of better. It will grow worse in the Air Force, in industry, in diplomacy, in hotels and hospitals, in schools—just about everywhere.

About the time we think we've settled into a nice, efficient routine, someone invents the jet-propelled airplane—or frozen foods—and we must revise our whole idea of what an air force or a kitchen is.

Things change; prices change; staffs change; population statistics change; even viruses change. And the result is always that the *problems* change. Even if you solved all your problems today, you would have a complete set of new ones next week. Some of the old ones might be back, but they *never* come back exactly the same. You need *new* solutions even for old problems. I mentioned some of the villains—routines, policies, habits. What are these? They are old solutions to old problems. They are proved. They worked. Of course they did—on the old problems. And, to the extent that the same problems still exist, with no new complications, no new twists, no new limitations or extension, these old policies, habits, and routines are still good solutions—but *only* to that extent. To the extent that the problem is new, you need a new solution. You need *new* ideas.

I have great respect for knowledge and for logic. But knowledge is essentially composed of answers to old questions and is only the raw material of new ideas. Logic is the study of how to manipulate and evaluate ideas. Neither of these can create *new* ideas. This is the job of the *imagination*. You acquire knowledge and logic in school and from expe-

[1]Presented at the 40th Annual Meeting of The American Dietetic Association in Miami, on October 23, 1957.

rience. But we seldom learn to use our imaginations effectively. For some reason, we tend to think of imagination as the domain of artists, poets, impractical dreamers, and children. We even become embarrassed at the thought of using our imaginations. Yet, if we are to cope with change, we *need* new ideas. If we are going to create change, we need new ideas. And, new ideas come *only* from our creative imagination.

Enemies of Creative Thinking

Why are new ideas so hard to get? What prevents us—all of us—from thinking creatively? Mental rigidity, the tendency to cling to old, outmoded routines, conformity, and habit are again the stumbling blocks.

Take driving as an example. You don't need to think about driving because it is a habit. In fact, it's a good thing it *is* a habit. Until the motions become habit, we have trouble thinking about other things such as where we are going. But as driving becomes so natural that steering and braking require almost no attention whatsoever, we can occupy our minds with the traffic, or the radio, or a conversation, or perhaps all of them at once. Habit has its values. It allows us to do things without thinking about them—*without thinking about them!*

Thinking is always difficult. In fact, Edison once said, "There are no ends to which the human mind will not go to avoid thinking." Both the good *and the bad* features of habit lie in that fact.

Routines are rather like habits, but not quite as unconscious. Routines resist change, first, because it is always easier to do something the old way than to learn a new way. Second, changing a routine gives some people a great sense of insecurity. Third, we eventually tend to view a routine as an activity in itself, instead of considering why we do it, and why we do it *that* way. In the Air Force, this seems to be particularly true of supply and record-keeping routines. Is it that way in your organization, too? Look at some of your routines and ask, "Why?" Then, "What if we changed this and eliminated that?" *What if?* That is a question that puts your imagination to work.

Let us also consider policies—not written policies handed down from on high in your organizational set up (though they often prevent progress and sometimes seem to be designed to prevent thinking). I mean the pat answers *you* have for certain more-or-less recurrent situations. You've never consciously called them policies. They are rather like intermittently habitual decisions. A policy—*any* policy—is a preconceived solution for a preconceived problem that may come up sometime in the future. The trouble with that is that we *never* know in advance exactly what form that problem will take. Things change, but policies seldom do. Setting a policy is a neat way to avoid really thinking about that problem when it does arise, but it is not a good way to solve problems.

Perhaps the worst enemy of creative thinking and of change is conformity. Do you have the courage to resist conformity when you think you are right? Do you have the courage to tolerate or even encourage the rebel who might be right? Ben Shahn, the artist, says, "Conformity is a mood and an atmosphere—a failure of hope or belief or rebellion." Seldom do we see a person with the courage to act like a free, intelligent, individual human being. When we do, it's refreshing. It's stimulating to hear a person express his own thoughts, guesses, opinions, and ideas instead of parroting everybody else, nodding in pleasant agreement, and taking the lazy, self-destroying path of easy conformity. Pity the poor administrator who happens to be wrong, whose whole staff happens to be wrong, except one person —and that person won't speak up because it's easier to nod and say, "Of course, of course."

Conformity resists change. The rebels are the ones who create change. There is always more inertia in a group than in any individual member of it. Are you an individual human mind, with a will of your own, an imagination of your own, a separate and distinct personality that is all your own? Or, are you just a cog in a gigantic machine, turning because of and just the way the other cogs do?

What Is Creative Imagination?

I know you are waiting for a clear, positive description of creative imagination. Our misconceptions have led us to expect a romantic, or perhaps a detailed psychologic definition. There is none—because there is no romantic mystery or highly technical psychologic explanation. Imagination turns out to be a very ordinary, very undramatic, very simple thing, with no real definition of its own. There are no describable characteristics of creativity other than it is the *lack* of mental rigidity, conformity, routine, and habit.

Creativity is definable only as a breaking away from these things and thinking the way our minds *ought* to function and *will* function when we've become aware of the things that hold them back. Creativity is not really a skill. It is an *attitude*. It is the *spirit* and the *courage* of adventure—the willingness to blaze new trails in the wilderness where there are no symmetrically planned streets, no train schedules, where conformity, habit, and routine have not reached. The creative person *dares*. He dares to think beyond the commonplace, the repetitive, the stereotyped, the ingrained.

This is not easy. Our whole environment holds us back. Our environment restricts—even punishes—the adventurer in ideas. But think what we might do if we could set up an environment that places no

value on conformity, that is outside the daily routines, that makes us think about our habits—an environment in which we question everything, in which we throw out tradition, convention, custom, preconceptions, and mental rigidity!

Brainstorming

Suppose we could set up a situation in which, just for a little while, we would take as our motto: "Nothing necessarily has to be the way it is," and ask, "What if?" Suppose we could establish a climate that encouraged free communication, individuality, intellectual rebellion, and mental free-wheeling.

How might we create such an environment, even for a few minutes? The psychotherapist can do it. The great teachers have done it. You can do it. A man named Alex Osborn dreamed up a perfectly simple procedure for doing it. He calls it "brainstorming." Osborn is no psychologist. He is an advertising man—a practical, work-a-day man interested in making money. When he noticed that most meetings in his company discouraged creative thinking, he invented brainstorming, which is rather more like a game than a psychologic treatment or a teaching method. It's silly, it's absurd—so absurd and silly that nearly every major corporation in the country is teaching it to its employees, and we teach it in the Air Force. We teach it because the craziest thing about it is that it works. It helps people get new ideas.

It is said that the Russians have an effective way of dealing with designers and others who don't produce enough ideas. They throw them in prison. In this country, we don't do that; we have people attend staff meetings. Most staff meetings are characterized by much talking and little thinking. Why is that?

The supervisor usually calls the people in and states the problem, gives a few ideas of his own, and then says, "What do you think?" There's a long silence. What goes on during that silence? Everyone is thinking, all right—but they are usually trying to decide between two courses of action: they can agree or keep quiet. Some are thinking, "Hmph! If he'd ever come down and work with us peasants once in a while, he'd *know* what's wrong." Others are thinking, "That's his problem. I have troubles enough of my own." At least one person is thinking, "What am *I* doing here?"

Eventually, someone may say, "Well, why don't we do so-and-so?" As soon as he stops talking, everybody starts telling him that his suggestion wouldn't work. This is no way to develop ideas. Nobody likes to be stepped on. The next time that person has an idea, he'll keep it to himself. A person learns early in life that a new idea almost always has some imperfections that need to be polished out. He also learns that people always jump on the imperfections as flaws that make the idea invalid, rather than considering them as minor problems that need to be overcome. This is a cruel environment to impose upon a newborn idea. It's a fragile and rather helpless thing. Victor Hugo said that a new idea is like an egg; nothing is so defenseless as an egg.

What is brainstorming? It's a ridiculously simple technique for conducting a committee or staff meeting when the purpose of the meeting is to solve a problem. During this meeting, four rules are enforced:

(a) *No criticism.* No idea presented is to be judged at this time. No objections will be voiced to any suggestion, no matter how far-fetched it may be. There will be time later for evaluation, not now.

(b) *Think wild.* Let your imagination fly. Crazy and comic ideas are encouraged. Fantastic ideas can easily be tamed down later.

(c) *Think fast.* Try for the greatest possible *number* of ideas in the time you have. The more ideas you produce, the better the odds of hitting a good one. And, the faster you work on thinking up ideas, the less time you have to prejudge your own ideas before you express them.

(d) *Combine ideas.* Try to build upon and combine the ideas others have given. Sometimes, someone will get right on the edge of a truly ingenious idea, and someone else need only add a little something or combine it with another idea to make its value apparent.

That, surprisingly enough, is all there is to brainstorming. Of course, it takes practice. Most people need to experience half a dozen meetings before they really "get the idea." Then they begin to "tear loose." Then ideas come thick and fast. People all start talking at once. They become excited, they begin to laugh, they get ideas—all because, just for a little while, the environment and the atmosphere are turned topsy-turvy.

The motto of Air University is *Proficimus more irretenti*, which is usually translated "Progress unhindered by tradition." Personally, I like the translation Major General M. K. Deichelmann once gave. He said it meant, "Stay loose, boy, stay loose." Brainstorming makes the situation "stay loose."

Brainstorming, of course, is not the only way to achieve creativity. There are several other methods and techniques that work equally well. They are gimmicks, just as brainstorming is a gimmick, but they work. Anything will work that allows us to get out of our daily mental grind, that shields us from the perpetual critics.

People love to tear a new idea to pieces. We learn this as children. Parents find it much easier to criticize a new and unusual idea than to work at finding some use for it. This is usually called "having mature judgment" or "thinking logically." I prefer to call it "thinking without thinking."

Do You Dare to Be Creative?

Dr. James Gates, Dean, School of Business Administration, University of Georgia, says: "It is fashionable in our society to be modest. We all have a tendency to decry our own abilities to be original. This is false modesty at best, and at its worst it leads to a sabotaging of our own talents. Perhaps the greatest gain to be derived from the current interest in creative thinking and applied imagination is that *it may become fashionable to have ideas.*"

You can create an atmosphere in your office, in your kitchen, in your organization where it is fashionable to question the old routines and methods and organizational structure. You can create in your employees and colleagues—perhaps even in your boss—a spirit of competition against habit. You can prod them to wake up their minds to function with a spirit of exploration and adventure and a new habit of always asking, "What if?" You can do all this—with brainstorming. Whether or not you ever hold a successful brainstorm, whether or not your brainstorm group comes up with any new ideas, the fact that you called them together to brainstorm puts them on notice that you *want* new ideas.

I warn you, however, don't do it unless you *honestly* want new ideas. If you are never going to accept any that kick over your favorite habit, policy, or routine, don't do it. The really big question is: do you prefer to plod along in your present rut, or do you *dare* to be creative?

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Mikkel Hindhede—February 13, 1862–December 17, 1945

Hindhede pinned his faith on potatoes as the most important article of diet for man, and his studies were convincing enough, at least to his own government, which set up a special laboratory for him in Copenhagen on January 1, 1911. This laboratory, which was the result of a petition from the Danish Committee on Agriculture, was devoted to experiments and research in human nutrition and was the first of its kind in Europe.

Mikkel Hindhede was born February 13, 1862, in West Jutland, Denmark, where his father was a farmer. He studied medicine and passed his final examinations with the highest honors attained by any student for the preceding forty years. He returned to West Jutland to practice medicine among the farmers and continued that practice for twenty years. He also served as chief physician at the new hospital in Skandenborg and was one of the first in his country to use antidiphtheric serum treatment. He became interested in nutrition of man and animals and came to the conclusion that protein was much over-emphasized. He believed that animals could do well on less protein and persuaded the farmers to practice his feeding methods, which they did with successful results. This, in turn, led to the establishment of the laboratory for Hindhede to carry on his researches.

Hindhede considered that a rich protein diet was harmful and that it was almost impossible to avoid getting enough protein. While he was a medical student, he had gone on a vegetarian diet and found his health and vigor improved. He considered protein foods expensive and therefore unpractical and so he advocated a diet of bread, potatoes, and fruit, together with a small quantity of milk when available. He wrote: "That it is cheaper to live directly upon the products of Mother Earth rather than to first put them through cattle, is so self-evident that no one can deny it. It will, however, surprise most physicians to learn that it is also the most healthy manner of life." Undoubtedly, physicians were and still are surprised to learn this, and Hindhede's teachings have not been accepted. On the contrary, present research shows the value of a liberal intake of protein. However, in balance studies, Hindhede did show that the nitrogen of potato was well utilized. He also demonstrated that potatoes in the diet yield a urine which is only slightly acid or even slightly alkaline and has a high solvent power for uric acid.

Hindhede wrote two books (listed below) putting forward his theories on nutrition and including recipes for the preparation of food. He wrote that the potato is "the best article of food I know of," but he considered other "vegetables neither cheap nor wholesome" and "meat I put in last place," although he did admit it was "not injurious in small quantities and best quality."

A photograph of Hindhede shows him with a rather thin face, high forehead, and long nose. He had four children, one of whom was raised on a purely vegetarian diet. Dr. Hindhede died on December 17, 1945.

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New Food Products and Processes[1]

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Problems of cost, storage space, and transportation force the military into the vanguard in developing new food preservation processes. Civilian consumers can expect in the future to benefit from such developmental research and can look forward to new and palatable foods, such as dehydrated vegetables and fruits, powdered fruit juices, and irradiated food.

THE ATOMIC AGE began when the predawn darkness over a desert in the southwestern United States was lighted by a man-made flash of light brighter than the sunrise. The date was July 16, 1945. It is axiomatic to say that the advent of this new source of energy will effect changes to our way of life. The impact on food technology—both direct and indirect—will benefit everyone.

We are inclined too often to relate all things atomic to death and destruction. Actually, the benefits from this newly available source of energy are many. In the field of food technology, direct use of such power will make food more abundant, easier to prepare, and easier to store. Indirectly, research in food technology is being spurred on by the impact of the atomic age on transportation and distribution.

History of Food Preservation

From earliest times, the preservation of food has been of concern to man. Primitive man gave little thought to this problem and so, by necessity, he was a wanderer, moving constantly to keep within warm areas where food was available. The growth and development of civilization made this impractical.

The early Romans are the first on record to have used ice and snow to preserve perishable foods. Centuries later, Plutarch advocated the additions of husks of grain to snow and ice to arrest thawing and thus prolong the preservation period. The Ancient Egyptians wrote of salting and sun drying and of constructing buildings for the protected storage of food. Old writings show that other peoples sought to preserve food by submerging it in oil—a practice which brought early death to many by food poisoning.

In recognition of the economic and social importance of food preservation, the French government in 1795 offered a prize of 12,000 francs for information as to how to preserve food. Nicholas Appert was awarded this prize in 1796. Fourteen years later, an Englishman named Durand obtained a patent on a procedure for sealing food in tin.

It was the American War Between the States, however, that sparked and stimulated the growth of the canning industry, just as World Wars I and II sparked and stimulated the exploration of other processes for the preservation of food—freezing and dehydration, for example.

Today, it is the atomic age, with all the implications of intercontinental transportation and trade, that is further stimulating the development of new technologic processes.

The military, not unlike the dietitian and housewife, is constantly troubled by budget and storage space problems. In addition, the military has a transportation problem in providing the American soldier with the kind of food he wants, regardless of where he is. Obviously, any technologic process which will cut costs, cut storage requirements, and cut shipping space requirements is looked upon with favor. Let there be a clear understanding, however, no technologic process will be accepted regardless of the savings in space and weight if, in the processing, the nutritive value is destroyed, or the food, when it reaches the soldier's plate, is not palatable and acceptable to him.

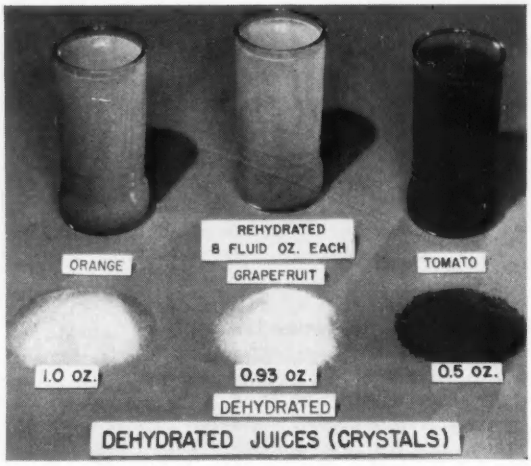
Let us now consider some of the new processing developments.

Dehydration

A whole new field has developed in the area of dehydration. There are now dehydrated precooked foods as well as dehydrated uncooked foods.

The type of dehydration process we talk of today with so much optimism involves dehydration of the food by high vacuum or freeze-dehydration techniques to produce a dehydrated item of negligible

[1]Presented at the 40th Annual Meeting of The American Dietetic Association in Miami, on October 2, 1957.



Orange, grapefruit, and tomato juices have been dehydrated successfully

moisture content. An almost negligible moisture content in the finished product, coupled with gas packing or an antioxidant, is the most important factor with respect to the keeping qualities. The new high-vacuum dehydration processes show great promise in that there seems to be but little loss in over-all quality between the original unprocessed product and the finished product. The quality of the original product (raw material) is the most important factor, since the quality of the end item is directly affected by the quality of the basic raw material.

DEHYDRATED BEVERAGES AND JUICES

One of the most interesting uses of this high-vacuum drying technique is in the dehydration of beverage items into powder form. Removal of water from such items which have a high proportion of water to solids causes significant reductions in space requirements.

Dehydration of fruit and vegetable juices has long been desired and explored. However, due to the large proportion of hygroscopic sugars and the fact that the products could not be brought to a low enough moisture control, caking occurred. In addition, the powders lost their respective characteristic fruit flavor through oxidative processes.

Currently, orange juice is being dehydrated under high vacuum to a powder. The method involves the evaporation of water under pressures of 1 to 2 ml. mercury. The solids puff up during the drying and the technique is commonly referred to as "puff drying." Orange juice, dehydrated in this manner, when packaged with a suitable desiccant in a vacuum container, does not require refrigeration and has a long storage life even at high temperatures. On reconstitution with water, the resulting beverage contains the flavor and nutritive value which the consumer expects of orange juice. The saving of weight and volume of this powder, compared with single strength juice, is 85 per cent in weight and 75 per cent in volume.

Dehydrated green beans can be successfully reconstituted even after long storage

The technique used to produce the orange juice powder is being extended to produce grapefruit juice powder, blended orange-grapefruit juice powder, and tomato juice.

This latter item—tomato juice powder—is of interest for this product is expected to serve a dual purpose. It will reconstitute with a given amount of water to tomato juice equivalent and to canned single strength tomato juice in flavor, appearance, and nutritive value. In addition, it can be used as a tomato paste or purée, depending on the amount of water and flavorings added to the powder.

Tomato juice powder, when available, will make possible not only a savings in weight and volume over the single-strength tomato juice, but will serve a dual purpose by replacing the canned tomato paste and canned tomato juice with one single item, tomato juice powder.

OTHER DEHYDRATED FOODS

The high-vacuum dehydration technique is being successfully applied to fruits and vegetables. Green beans can be dehydrated by this new process to produce an excellent product and even after long storage periods seem not to lose the characteristic color, flavor, texture, and nutritive value associated with the original material.

Dehydration of meats, fish, and poultry by the freeze dehydration technique shows great promise, both as an economical and feasible processing procedure and as a means of achieving significant savings in space and weight over the fresh item.

It may be of interest to learn that in a ration which the Quartermaster Corps planned for use by Antarctic explorers, beef, pork chops, vegetables, and fruits preserved by these new processing tech-

Freeze-dehydrated ration supplied to Antarctic scientists during the International Geophysical Year

niques were included. This ration, planned for our scientists operating from snow tractors far from a base of supply for 130 days during the International Geophysical Year, had to be, by necessity, as light and as small in size as possible. The ration successfully used last year weighs about 3 lb. and provides 5000 to 5500 calories per day.

Here is a typical meal which makes maximum use of new dehydration techniques. This meal weighs slightly under 1 lb.

Dehydrated beef steaks (2 per man)
Dehydrated onions
Potato granules
Dehydrated green beans
Crackers and canned butter
Canned fruit cake
Hot instant dried chocolate milk

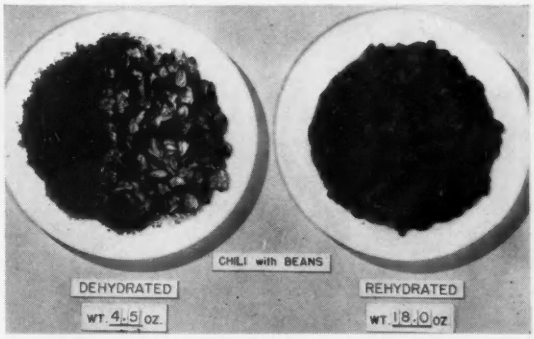
PRECOOKED, DEHYDRATED FOODS

The field of precooked, dehydrated foods offers vast possibilities. These foods require little in the way of equipment for preparation. As in the case of dehydrated food, no refrigerated storage space is required, and the reduction in weight and volume effects savings in transportation and storage.

Precooked, dehydrated foods are ready to eat immediately following the addition of a little hot water and a short wait while the water is being soaked up. A typical menu utilizing these new precooked foods could include the following items. The meal weighs slightly over 1 lb.

Precooked, dehydrated chili and beans
Instant rice
Dehydrated fruit mix or applesauce
Crackers, butter or margarine
Cookies
Instant cocoa beverage

Food technologists predict that these precooked dehydrated foods, when prepared according to a good recipe, frozen and then dehydrated under high vacuum if they are meats, or high-vacuum dehydrated if they are fruits, will be indistinguishable in flavor, taste, appearance, and nutritive value from their freshly prepared and cooked counterparts.



Chili with beans, an example of dehydrated precooked food

Dehydro-Freezing

Another new processing method involves both dehydration and freezing, and is called dehydro-freezing. Dehydro-freezing is a technique by which the water is taken out by dehydration, prior to freezing. Products processed in this manner will require only 50 per cent of the refrigeration space now required for frozen fruits and vegetables.

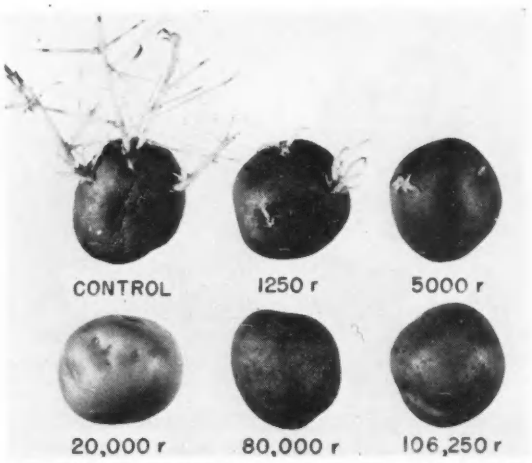
Although this process is currently limited to dehydro-frozen peas, carrots, apricots, and apples, the development of a dehydro-freezing industry is of particular interest to institutions. The quality of dehydro-frozen products is comparable to the frozen foods now available—as is the total preparation time. Rehydration poses no problem, as it occurs during the thawing or cooking period.

So much for the indirect effect on food technology that the advent of the atomic age has caused.

Irradiation

The direct effect is in the application of atomic or nuclear energy for the irradiation of food. This method of preserving food utilizes the gamma rays from radioactive isotopes and electrons which are generated by man-made devices. By subjecting foods to gamma rays or electrons, microorganisms, insects, and parasites which damage food or carry infection can be destroyed.

The behavior pattern of rays from radioactive isotopes and the electrons from man-made machines illustrates the principles of this new food processing technique. Three types of rays emanate from fissionable material: alpha radiations, beta rays, and gamma rays. Alpha radiations have no power of penetration—a piece of paper is sufficient to stop them. Beta rays do somewhat better as they can be made to penetrate up to 0.6 cm. water or an equivalent amount of food. These rays may be of some importance in food processing in the future but it is



Sprouting of potatoes during storage can be retarded by irradiation with gamma rays

unlikely at present. The gamma rays show the greatest powers of penetration and can be made to penetrate 30 cm. food, water, or other substance. These rays show the greatest promise.

The electron accelerator is a man-made device for producing a bombardment of electrons which penetrate the food to damage the target, which, in this case, is shown to be the yeasts, molds, and bacteria. The ultimate effect of the irradiations on the microorganisms, insects, and parasites are not as yet clearly defined. It is believed that either by striking the organism or the surrounding media, the emanations so disrupt the internal equilibrium of the microorganisms, insects, and parasites that they cannot reproduce.

It is anticipated that this new process will, through low doses of these emanations, effect a pasteurization which will markedly prolong the storage or shelf-life of our foods, particularly when combined with such processes as antibiotics or moderate refrigeration.

The use of higher doses to the extent that foods can be sterilized and thus capable of being held for long periods of time without refrigeration is being actively explored. Many foods have been processed in this fashion. Successful use of irradiation has demonstrated that insects in dried fruits and cereal products can be destroyed; and, that the growth of blue mold on citrus fruits and the sprouting of potatoes can probably be prevented.

Irradiation of food to prolong storage and prevent deterioration is a radically new process involving a radically new source of energy. It is acknowledged that the preservation of food by irradiation is still in the research stage. Some foods subjected to irradiations develop off flavor and degradation of texture. On the other hand, irradiation of other foods produces items which are well accepted.

There is a general feeling of confidence, however, that there are few major technical obstacles which will not yield to research. Tests are continuing to determine proper dosages and what causes off odors and texture degradation.

Extensive animal and human feeding tests are underway to prove to the satisfaction of appropriate regulatory agencies the wholesomeness and nutritional adequacy of irradiated foods. These studies have been carried out according to the rules laid down by the Office of The Surgeon General of the U.S. Army, and the Food and Drug Administration of the Department of Health, Education and Welfare. Additional studies are in progress to insure freedom of the treated foods from residual radioactivity.

HUMAN STUDIES

It was with pride that the Quartermaster Corps accepted and assumed the leadership of this vast project. The scope of the project is enormous. An extensive organization and program has been developed. Not only governmental agencies are involved; over ninety contracts have also been made with private industries and research institutions.

At the Medical Nutrition Laboratory of the Army Surgeon General, over forty foods that have been irradiated have been consumed by human volunteer subjects. The caloric consumption of irradiated foods has comprised up to 100 per cent of the total diet. No toxic effects have been observed and no significant differences in energy value, utilization of protein, or digestibility between the irradiated and non-irradiated food have been observed.

Studies with the human subjects have been limited to fifteen-day periods. Future tests involving long-term animal feeding will be followed by studies using human volunteers eating diets of irradiated foods for periods up to nine months. These tests will provide the basis for the final evaluation of the wholesomeness and acceptability of irradiated foods.

At present, the items subjected to "pasteurization" doses to extend shelf-life which show the greatest promise are: carrots, peaches, peas, apples, asparagus, broccoli, Brussels sprouts, beets, pork sausage, pork tenderloin, cured ham, pork chops, chicken, pork roast, and lamb chops.

As far as the program for the high-dose irradiation sterilization of food is concerned, it is in this process that the loss of acceptability in certain items is now occurring. It is this process, however, which, when successfully developed, will allow meats, fish, vegetables, and fruits to be held for long periods without refrigeration.

In summary, through the combined efforts of many research facilities, both governmental and private, a whole new combination of food processing techniques is evolving. All are destined to simplify the preparation and storage of food.

Up-to-Date Recipes[1]

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IN EXAMINING cook books written during the last century, we find that recipes have changed considerably, measurements have become more exact. No longer do we see measurements expressed as a piece of butter the size of a walnut, or a pinch of this or that. The form of writing recipes has changed, also. Many of them now are in step form so they can be easily followed. Authors of cookbooks have become more "cost conscious" and we rarely see a recipe calling for a pound of butter and a dozen eggs. The equipment now available, such as measuring spoons and cups, assures more accurate measurements and less variation in results.

Food preparation today has changed and is continuing to change. We are faced with new products and ingredients appearing on the market, with changing food patterns, with changing standards and values, and with the casualness of present-day living.

With the high labor costs in quantity food preparation—and the lack of time of the married homemaker who holds a job outside the home—have come "more convenience foods." Someone has made the statement that we are now in the "era of 'instant' foods, 'minute' foods, and 'ready-prepared' foods."

More and more kinds of equipment are coming on the market, more and more "convenience" items added to the present equipment. Popularity stems from the saving of time and energy, accuracy, versatility, portability, ease and economy of operations, and easy cleaning features. In modernizing or bringing recipes up-to-date, these facts must be kept in mind.

When the word "recipe" is used, it signifies a practical "tool," and that is what it is—but it can and should also represent the application of findings of research and experimentation.

It is the recipe that aids in the production of quality food. But, the recipe serves this function, only if it:

(a) Has clear and complete directions.

(b) Is written in a form easy to follow.

(c) Is carefully examined frequently to see if it is up-to-date—up-to-date in the use of time and energy, the use of new products, the use of modern equipment—and if the quality could be improved.

In discussing recipes, the facts to be given here are based on small quantity or family-size recipes. The principles behind the preparation of small and large quantities are basically the same, although the application may be carried out in a slightly different manner.

In two previous talks at meetings of The American Dietetic Association, consideration was given to the "Evaluation and Simplification of Recipes" (1) and to "Recipe Construction" (2) Here we will consider the use of some equipment, new styles in foods, and flavor.

Equipment

The use of equipment to save time and energy and to give more accurate and uniform results is becoming increasingly popular. Pieces of equipment that can serve more than one use—thus requiring less storage space and representing a smaller outlay of money—are replacing some of the pieces formerly used. More and more is being learned about equipment and how to use it to best advantage. Almost every home and certainly every large institutional kitchen has one or more electric mixers. The small portable mixer has become quite popular because of its convenience for mixing a small amount and when only a small amount of mixing is needed.

At one time it was believed that an angel food cake could not be mixed successfully with an electric mixer—that if any part of the cake was mixed, the flour would have to be folded in carefully by hand. At one time, it was believed that a flat egg beater—a wire whisk—produced a volume of beaten egg whites larger than if beaten with a mixer. At one time, "folding" always meant carefully folding over with a spatula, a spoon, or wire whisk.

Actually none of these facts need to be true. High quality angel cakes can be mixed in an electric mixer. In fact, some people feel that they are superior in quality. A flat egg beater does not produce a larger volume of egg white foam, and careful

[1] Presented at the 40th Annual Meeting of The American Dietetic Association in Miami, on October 23, 1957.

TABLE 1 **Principles in the use of the electric mixer**

PRODUCT	RECIPE	MIXER DIRECTIONS	REASON(S)
Angel cake	High in egg whites, sugar, and cream of tartar; low in flour	1. Add flour with a minimum of mixing 2. Add flour about 1 Tbsp. at a time 3. Mix *only* until no dry flour is visible.	1. These proportions of ingredients allow more mixing. 2. The slow addition of flour gives a fine grain. 3. Over-mixing produces a heavy cake of small volume.
Egg white foam	If sugar is required, add at the foamy stage	Beat until fine to the very edge of bowl	1. Sugar helps prevent the effect of over-beating. 2. Over-beaten egg whites lose their elasticity and stability. 3. A fine foam gives a fine-grained product.
White cake	Relatively high in shortening and sugar	Mix thoroughly	1. Cakes high in shortening and sugar can and should be well mixed. 2. A cake of fine grain and texture will be produced with these proportions and sufficient mixing.
Mayonnaise	Usual proportions	1. Add about ⅓ of the oil slowly at first, drop by drop, to the egg-vinegar mixture 2. Regulate the speed of beating for the stiffness desired	1. Emulsion is more perfectly formed if oil is added slowly at first. 2. The stiffness seems to increase in direct proportion to the speed of beating. The emulsion thickens as the rate of beating increases.
White Mountain-type frosting	Relatively high in egg whites and with an acid or corn sirup added	1. Beat until frosting will hold its shape 2. Do not over-beat	1. The egg whites, acid, or corn sirup will interfere with crystal formation. 2. Over-beating may cause a sugary crust. 3. With over-beating, the frosting may become thick and then get thin.

manipulation of the beater of the mixer at low speed does the same "combining" job as folding, with an outlay of less time and effort.

Mixers are more efficient than hand beaters, and large institutional-size mixers are more efficient than home size. Thus it may be necessary to change the manipulation, the ingredients, or the proportion of ingredients and include certain precautions to insure good results.

With flour mixtures—batters and dough—because of the efficiency of the beaters, it is easy to develop the gluten more than desired. If the gluten is over-developed, the baked product will have a poor grain and texture, be heavy and of small volume. It is well to remember:

(a) If batters and doughs are low in fat and sugar, mixing should be done at low speed—and very little.

(b) If batters and doughs are high in fat with its "shortening" action and high in sugar with its "dispersing" action, then more mixing is needed.

(c) If part of the flour is replaced with cereals, such as cornmeal, oatmeal, or bran, such batters can be mixed more.

A few examples have been selected in Table 1 that will illustrate the use of an electric mixer.

Other pieces of equipment and tools can also give accurate and uniform results. The popular automatic electric coffee makers with their temperature and time controls *can* produce excellent coffee with the correct amounts and grinds of fresh coffee. Too high a temperature with loss of flavor and solution of the bitter caffetannic acid is automatically prevented. The control of the time the coffee is in contact with the water is likewise automatically controlled to insure maximum solution of the caffeol flavor constituent and reduced solution of the bitter caffetannic acid. However, the coffee must be freshly made to retain the volatile flavor, and the coffee maker must be clean. Removing the oily film from all parts of the coffee maker that can give a rancid and unpleasant flavor presents a problem, however. Some manufacturers put out a cleaner for this purpose. Washing the coffee maker with a detergent is also suggested. Another suggestion is: after washing thoroughly, add vinegar to the water and run a complete circuit of the coffee maker. Soda should not be used as it can be harmful to the metal of the coffee maker.

The temperature-controlled burners on gas and electric stoves are in some cases replacing the double boiler. The use of electric skillets and of deep-fat fryers give more uniform results than can be obtained with practical tests or guesswork.

Thermometers for sugar cookery, deep-fat frying, oven, and meat cookery give an exactness that is difficult to obtain otherwise.

TABLE 2 **Advantages of using exact temperatures**

PRODUCT	TEMPERATURE	EQUIPMENT	REASON(S)
Foods fried in deep- or shallow-fat	Correct temperature for product	1. Thermometer 2. Electric deep-fat fryer 3. Electric skillet 4. Temperature-controlled burner	1. If temperature is too low, food absorbs fat. 2. If temperature is too high, product may be underdone. 3. If fat smokes, the fat will decompose and there will be a lowering of the smoking temperature and an undesirable flavor formed.
Roasts	1. Low oven temperature 2. Internal temperature depending on degree of doneness desired	1. Oven thermometer 2. Meat thermometer	1. A high oven temperature will produce a less tender, less juicy roast. 2. Overcooking: if cooked to too high a temperature, the roast will be drier and less tender.
Crystalline-type candy and frosting	Correct temperature for type	Thermometer for sugar cookery	1. Candy and frosting will be soft if temperature is low. 2. Candy and frosting will be hard and dry if temperature is high.
Griddle cakes	Moderate temperature	Electric skillet	A high temperature may cause a "pitted" product.
Pectin jelly	Temperature to indicate a final sugar concentration of about 66 per cent	Thermometer for sugar cookery	1. Jelly will be soft if final sugar concentration is low. 2. Jelly will be sticky and tough if final sugar concentration is high.
Potatoes	Oven 425°F.	Oven thermometer	High oven temperature produces a dry, fluffy, mealy potato.
Soft-stirred custard	Simmering temperature	Controlled burner	1. More even cooking will result. 2. There will be less tendency for curdling.
Scrambled eggs	Simmering temperature	Controlled burner	1. Large clumps of evenly coagulated eggs will be formed. 2. The low temperature retards the formation of dry, small curds with the liquid squeezed out.

The illustrations in Table 2 show the advantages of using exact temperatures.

Styles and Standards

Styles and standards of foods are changing. This may be due to the availability of foods, better transportation and storage, new processing methods, methods of cooking based on greater retention of nutritive value, methods of preparation that produce more uniform quality, the use of new equipment, and the emphasis on simplification.

Some ingredients as they appear on the market are different or in different forms. The widespread sale and use of non-fat dry milk is comparatively new. The delicious sour and salad creams readily purchased in most markets, processed and precooked rice, the large curd cottage cheese with its less acid flavor, and homogenized milk and cream are somewhat different.

Since so much bread is baked outside of the home now, all-purpose flour has replaced much of the bread flour. The slow-acting yeasts are no longer available; bread starters and sponges seem to be things of the past.

Fats have changed. With the advent of the quick, one-bowl method of mixing cakes has come about the addition of emulsifiers to hydrogenated shortenings.

Many dried foods have been partially replaced by fresh and frozen. Dried salted codfish, once so common, is now more difficult to purchase. Dried fruits are no longer so hard and dry. With such products new methods of cookery should be used.

Fine grained, sweeter cakes are replacing the coarser, more fluffy type.

With the common practice of pasteurizing milk, there is less sour milk in the home, so sweet milk and baking powder have replaced much of the sour milk and soda. The commercially cultured buttermilk now available has a controlled acidity different from that of the old-fashioned buttermilks.

Frying chickens and turkeys, once seasonal, can be purchased at any time of the year. Graded meat gives an assurance as to quality. The modern pork chop has less fat.

Some of these new styles may mean fewer calories, lower cost, a difference in standard, but many also

TABLE 3 **Recipe changes due to new styles in foods**

PRODUCT	CHANGE	PROBLEM(S) INVOLVED	REASONS
Yeast breads	1. One fermentation period replacing the two or three usually allowed 2. Use of an acid ingredient in correct amounts, such as buttermilk, sour cream, fruit juices, and so on	To produce a tender product	1. Acid is formed in the fermentation of bread. This tenderizes the gluten. Additional acid is formed with each fermentation period. 2. An added acid ingredient has about the same effect that the additional fermentation periods do.
Dried prunes	1. Simmer until tender 2. Do not soak	To replace water lost during dehydration	1. Prunes are not as dry as formerly. By cooking below boiling, sufficient water is absorbed without soaking. 2. If soaked, prunes become "watery" and flavor is diluted.
Cakes	1. Use of quick, one-bowl method of mixing 2. Use of shortening containing an emulsifier	To produce a cake of fine grain and texture	The emulsifier aids in the production of the fine grain.
Processed or converted rice	1. Cook in the amount of water that will be completely absorbed 2. Cooking in a covered casserole in the oven is a desirable method	To conserve nutrients	Processed or converted rice is a significant source of thiamine and iron. This method of cooking conserves these water-soluble vitamins.
Refrigerator iced tea	1. Pour cold water over tea, using 2 tsp. to 1 c. water 2. Let stand overnight in refrigerator	Minimum extraction of tannin	1. Tannin is less soluble at a low temperature. 2. With little tannin, a clear iced tea with a bland flavor is obtained.
Bright green cooked vegetables	Cook for a short time	To conserve nutrients	1. More of the water-soluble and heat-destroyed nutrients are lost as the cooking period is lengthened. The green color indicates less loss, as insufficient time has been allowed for this loss and for the acid from the cells to act on the chlorophyll.

require a change in the recipe. A few examples are given in Table 3 to illustrate these changes.

Flavor

One of the most important qualities of food is flavor. Other undesirable qualities are often over-looked if the flavor is good. The quality of the ingredients used is important in obtaining good flavor. Imitation vanilla will not give the same flavor that a true vanilla extract imparts—and there are differences in vanilla extracts. Have you ever run taste panels and comparisons of different brands of vanilla? There is a marked difference in strength and flavor. Stirred custards flavored with different vanillas taste quite different. Some extracts that seem expensive may not be, as they are stronger and less is required. A little time spent on this problem may mean better quality as far as flavor is concerned.

Flavor includes taste and smell and is influenced by texture. Temperature is important. We are all familiar with the saying: "Hot foods should be served hot, cold foods cold." However, the sensitivity of taste is greatest at room temperature or a little above—about 68° to 85°F. An ice cream mix seems excessively sweet before it is frozen but is of the right degree of sweetness after freezing. A soft ice cream is often enjoyed more than a hard one because of the flavor. Some like a custard pie or baked custards at room temperature because of the flavor. Many undesirable flavors are more apparent at certain temperatures. Rancid bacon and fats are more apparent at low temperatures. The decomposition of proteins is noticeable at high temperatures.

Often certain of the four primary tastes—sweet, sour, salty, and bitter—can be used to bring out certain flavors and diminish others. Salt is used to bring out the flavor of foods. In candy, salt diminishes the sweetness slightly; in grapefruit, it accentuates the sweetness and diminishes bitterness. In coffee, also, a little salt diminishes the bitterness.

The "mouth feel" of foods affects flavor judgment. A mealy, too tender pastry that clings to the roof of your mouth; a buttery, too rich ice cream; a stiff rubbery gelatin mixture; or a too-stiff cream pie filling all give an undesirable effect on flavor.

Bitterness of taste is not always noted when a food is first sampled. Because the bitter taste sense is more developed at the back of the tongue, it is no-

TABLE 4 **Solutions to flavor problems**

PRODUCT	UNDESIRED CHARACTERISTICS	REASON(S)	POSSIBLE SOLUTION
Coffee	Undesirable, metallic flavor.	Allowed to stand in a metal pot for a period of time. Metallic salts are formed.	1. If made in metal pot, make it frequently. 2. Do not allow it to stand in a metal pot for some time.
Baked products using a combination of sulphate-phosphate type of baking powder	Bitter taste	This may be due to the use of an excess amount of baking powder. Residue imparts a bitter taste.	Use only the amount needed. Less is needed of this type of baking powder as compared with other kinds.
Baked products using soda and an acid ingredient	Bitter taste	1. More soda is used than is needed to neutralize the acid. 2. A bitter residue of sodium carbonate is left in the product.	1. Use only the amount needed to neutralize the acid. 2. A devil's food cake is an example of soda that is not neutralized. To many people, however, the red color and tenderness compensate for the flavor.
Cream-of-tomato soup made with soda to neutralize the acid of the tomatoes	Loss of natural flavor of tomatoes	The natural flavor is lost if the mixture is basic.	Use another method to prevent curdling: a. Combine equal amounts of cold milk and cold tomato juice; then heat. b. Use a thin white sauce.
Overcooked vegetables of the turnip and cabbage families	Strong, undesirable flavor	With long cooking, the sinigrin in these vegetables is hydrolyzed to hydrogen sulphide.	Cook for a short time so there is insufficient time for this reaction to take place.
Starch-thickened pie fillings	Lack of natural flavor	Flavor is affected by the te ture. The product is too thick.	1. Use only enough starch to form a filling of desired thickness. 2. Amount of starch needed varies with standing time. More is needed if time is short, less if time is longer.

ticed as an after-taste when the food is swallowed.

The concentration of the flavoring substance affects its desirability. A small amount may be desirable but a large amount may be most unpalatable and in some instances not even recognized.

Good seasoning and flavoring is done subtly. A suggestion of garlic can add to the flavor, too much can be distasteful. A bit of cinnamon added to a chocolate frosting gives an intangible flavor that is most pleasing. A light sprinkling of nutmeg to creamed chicken, a small pinch of thyme added to cooked vegetables all add a "spark" to well known dishes if done in the right amounts.

The natural flavor of foods should be retained and brought out—not lost or masked. The natural flavor of well cooked vegetables goes hand in hand with retention of nutritive value. The *p*H is important because of its effect on flavor. If alkaline, the natural flavor is lost.

Flavor is affected in the products listed in Table 4.

Summary

A recipe should be examined frequently. It should be changed—changed to use the new products on the market, to use more efficient equipment—to meet the new standards. It should be simplified. If the recipe is kept up-to-date, it can be a tool in the production of quality food.

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Revolution in the Kitchen

With the advent of electronic ovens in the home kitchens, homemakers will have to accept an entirely new set of standards when they cook, according to Evalyn Brinkman, Associate Professor of Home Economics, Illinois Institute of Technology, Chicago. "The miracle of electronics means that the average woman will need to time cooking by minutes and seconds, judge both weight and thickness of foods, and have the patience of Job to learn to use her new piece of equipment," Mrs. Brinkman comments. "The housewife of the future must be a competent judge of mass, since time for a given degree of doneness is a function of mass. Six meat patties take four times as long to cook as one."

Nutrition of New Mexican Spanish-American and "Anglo" Adolescents[1]

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NEW MEXICO has many Spanish-speaking people, descendants of the early Spanish explorers who came into the area in the sixteenth century. These people are known locally as "Spanish-Americans" to distinguish them from their English-speaking neighbors, known as "Anglos," and the recent Spanish-speaking immigrants from Mexico, simply called "Mexicans" (1). Most of the Spanish-Americans live in the northern part of the state. Some of their customs, including food habits, differ from the ordinary American pattern (2).

In the early days these people were able to produce most of their food supply, but their land holdings have decreased in size and productivity until this is no longer possible. Many have been forced to leave their homes to seek employment in nearby towns or as migrant agricultural workers and must depend on foods purchased at local stores. The diets of many are extremely limited and some of the familiar foods have been replaced by Anglo foods of possibly inferior nutritive value (3,4). For these reasons the study reported here was made in a community where both cultures were represented.

Las Vegas, New Mexico, seat of San Miguel County, was chosen because it was large enough to provide subjects of the desired age group, had facilities for setting up the laboratory and housing for the staff, and cooperative school officials and students.

Las Vegas is really two towns—"Old Town" where the population is almost entirely Spanish-American, and the newer section, which also has many Spanish-American residents. The population of the two towns was 13,762 in 1950. The participants in the study were students at Las Vegas High School, Town High School, several elementary schools in Old Town, and two rural schools about 30 mi. from Las Vegas. Las Vegas High School has pupils from both old and new sections, nearby small villages, and farms and ranches in San Miguel and adjoining counties. Some of the rural students live in town during the school year. Others are brought in each day by school buses from their homes.

San Miguel County is a sparsely populated mountainous region. Ranching is the principal industry. Some wheat, oats, barley, and sorghum are grown. Some families in Las Vegas have gardens, but the growing season in the mountainous areas is far too short for many fruits and vegetables.

The Subjects

One hundred ninety-five students registered for the study, but several dropped out later.

The group eventually contained 79 boys and 99 girls, all fourteen, fifteen, or sixteen years of age when they registered for the study. There were 113 Spanish-Americans, 64 Anglos, and 1 Negro. As the food habits of the Negro resembled those of the Anglos, her data have been tabulated with that group. The classification into Spanish-American or Anglo was based on name, language, food habits, and the opinion of the subject and the interviewer.

In the 1950 census, 77 per cent of the total white population of San Miguel County had Spanish sur-

[1]This study was part of the Western Regional Research Project on the Nutritional Status of Population Groups in the West. The New Mexico phase was under the direction of the New Mexico Agricultural Experiment Station. The investigation was financed in part by funds appropriated under the Research and Marketing Act of 1946. The cooperation and assistance of the Human Nutrition Research Division, U.S. Department of Agriculture and the U.S. Public Health Service are acknowledged. The technical assistance of George De Young, M.D., Stella Peeks, May Bay, John Barnwell, Mildred Snowden, Donna Harbison, Mariana Kulas, Ellen Morse, James Moody, Mae Martha Johnson, and Maurice Finkner is acknowledged. Journal Series No. 110, Agricultural Experiment Station, New Mexico College of Agriculture and Mechanic Arts. Received for publication June 10, 1957.

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names. Of these, 1.9 per cent had been born in Mexico (1). However, all the Spanish-Americans in this survey reported that they were born in the United States, 106 of them in New Mexico and 7 in Colorado. Thirty-four of the 65 Anglo subjects were born in New Mexico, 6 in Colorado, 6 in Texas, and the others in eleven widely scattered states.

All but two of the Anglos were in high school; but 43, or almost 40 per cent, of the Spanish-Americans had not yet entered high school. For some purposes, the subjects were reclassified according to educational level.

General Plan

As the study was part of a larger regional project, the general plan was the same as that followed in the other cooperating states. Laboratory procedures were standardized, and several of our researchers had participated in similiar projects.

When the student registered for the study, he (or she) was questioned about his dietary habits and food resources and instructed in keeping the seven-day food records which formed the basis for calculation of intakes of essential nutrients. At the time of the physical examination, a medical history was taken. Blood and urine specimens for laboratory analyses were obtained, and X-rays of the hand and foot were made for determination of bone density by the Mack technique.

The nutritionist obtained a general picture of the food habits and resources of the participant from replies to a standardized questionnaire about home production and preservation of food, usual meal patterns, food dislikes or allergies, use of dietary supplements, and so on. No attempt was made to get information about income, but the sampling appeared to represent all income groups. A seven-day record of all food eaten formed the basis for calculation of nutrient intakes and gave additional information about food habits.

Home Production and Preservation of Food

Fifty-nine per cent of the Anglos and 65 per cent of the Spanish-Americans reported that they produced part of the food they ate. Fruits and vegetables were reported more often than other food groups, followed by poultry, eggs, meat, and dairy products. The production of fruits and vegetables was limited by the lack of water in non-irrigated locations and the shortness of the growing season in the more mountainous areas.

The situation regarding food preservation was essentially the same as for food production. A slightly higher proportion of Spanish-Americans than Anglos preserved some food at home. Fruit was the food most frequently preserved, followed by vegetables and meat. The methods of preservation differed in the two groups. Both groups canned fruits, vegetables, and meats. More Anglos froze food while many more Spanish-Americans dried foods—meats, fruits, vegetables, and legumes.

Meal Patterns

As would be expected in this age group, the majority of these teen-agers ate most of their meals at home. Although a few purchased lunches on school days, most who could not go home at noon carried prepared lunches.

Few participants skipped breakfasts regularly, and only one student turned in a seven-day food record without breakfast. However, it was not uncommon for a student to miss breakfast one or more times during the week. Girls missed breakfast more often than boys, and the Spanish-American girls missed more often than the Anglo girls. Breakfasts were most often skipped on Sunday, least often on Saturday. However, many breakfasts were very light, and less than 4 per cent of the breakfasts supplied one-third of the day's requirements. The Anglo boys generally had better breakfasts than the other groups, but only 8 per cent of their breakfasts could be considered adequate.

Light or snack-type meals were common at both the noon and evening meals. Apparently, most families had one main meal, either at noon or in the evening, and had left-overs or easily prepared snacks at the other meals. Some students, who carried their lunch or bought a hamburger and soft drink for lunch, missed the family's main meal at noon and had another incomplete meal at night.

Most of the participants had between-meal snacks. These averaged slightly more than two a day. The high school students had snacks more often than the grade school participants. Candy and soft drinks served as snacks more than twice as often as any other food. Girls had more candy and soft drinks than the boys. Milk often made a bedtime snack, especially for the Anglo boys.

Consumption of Different Food Groups

The data on consumption of different food groups are summarized in Table 1.

PROTEIN FOODS

Milk consumption ranged from none (reported by seven subjects) to eighty-four 8-oz. servings in the seven-day period. There were wide variations between these extremes, but many participants reported only the small amount of milk used in coffee. The girls had less than two-thirds as much milk as the boys, and the Spanish-Americans only a little more than half as much as the Anglos. The Anglos had roughly twice as much ice cream and cheese, and the girls had slightly more than the boys. Cheese was seldom eaten by any group.

TABLE 1 **Mean number of servings of different foods eaten per week**

SUBJECTS	NUMBER OF SUBJECTS	MEAN SERVINGS										
		Milk	Cheese, ice cream, etc.	Eggs	Meat, poultry, fish	Beans, nuts	Leafy green and yellow vegetables	Citrus fruits, tomatoes, raw cabbage	Potatoes, other vegetables and fruits	Bread, flour, cereal	Butter, margarine	Sweets
Boys												
Spanish-American	46	13	4	7	10	10	7	3	20	51	5	35
Anglo	26	22	8	6	16	3	8	8	19	48	16	48
Total	72	16	6	7	12	8	7	5	20	50	9	40
Girls												
Spanish-American	56	9	5	4	11	7	7	4	15	42	5	32
Anglo	34	14	10	3	13	4	7	6	14	36	11	50
Total	90	11	7	4	12	6	7	5	15	40	7	39
All Subjects												
Spanish-American	102	10	5	5	11	8	7	4	17	46	5	33
Anglo	60	17	9	4	14	3	8	7	16	41	13	49

The consumption of *meat, poultry, and fish* varied widely. One subject had no meat and four others only one serving during the seven-day period, while thirteen had from twenty to thirty servings. The average consumption for both sexes was about the same. The Anglos averaged slightly more than two servings a day while the Spanish-Americans had one and a half servings.

The Spanish-American subjects ate an average of five and a half *eggs* per week and the Anglos, four and a half. This is in agreement with the statement above that more Spanish-Americans than Anglos produced part of the food they ate. Thirty-eight per cent of the Spanish-Americans and 24 per cent of the Anglos had poultry and eggs at home. The boys ate an average of 6.5 eggs per week and the girls, 3.9. Of the fourteen who ate no eggs during the week, twelve were high school girls—six Anglo and six Spanish-American. The two boys said they disliked them and one said he was allergic to them.

The importance of *dried beans* in the nutrition of the New Mexican people is shown by the records. While the Spanish-Americans ate them more frequently and in larger amounts than the Anglos, only eighteen of the entire group failed to have dried beans at some time during the week. Pinto beans were eaten much more frequently than other kinds, but canned baked beans were reported frequently, black-eyed peas and dried Lima beans occasionally, and horse beans (broad beans) once. The Anglo boys and girls had beans about three times a week compared with eight times for the Spanish-Americans. The Spanish-American high school girls, however, did not average one serving of beans a day. The Spanish-American grade school boys had them an average of twelve times a week.

ASCORBIC ACID-RICH FOODS

The Anglos had an average of one serving a day of citrus fruit, cabbage, tomatoes, or other ascorbic acid-rich source, while the Spanish-Americans had just half that amount. As with other food groups, there was considerable variation, with many having less than one serving a week and about 8 per cent having fifteen or more. However, differences between the two groups in the actual intakes of ascorbic acid and levels of the vitamin in the blood were slight and not statistically significant, though both were slightly higher for the Anglos.

It was difficult to evaluate the ascorbic acid content of the large amount of chile eaten by the Spanish-Americans because of the highly variable, and often large, loss during processing of this food. For purposes of this study, it was listed as an ascorbic acid-rich food only when fresh or canned chile was specified on the record.

VEGETABLES

Because even dried chile (hot pepper) retains most of its mineral and vitamin value (5), except ascorbic acid, it was included among the *leafy green and yellow* vegetables. There was little difference in the mean consumption of leafy green and yellow vegetables by the Spanish-Americans and Anglos, as the members of both groups had approximately one serving per day. However, the kind of vegetables eaten by the two groups differed. Chile was eaten by both groups, but much more frequently by the Spanish-Americans, who ate less of the more customary vegetables than the Anglos.

Potatoes and other vegetables were eaten two to three times a day by all groups. The girls, both Spanish-American and Anglos, had the least with fourteen and fifteen servings a week. The boys in both groups had twenty servings a week.

BREAD, CEREALS, AND SWEETS

All groups averaged five to eight servings of bread or cereal daily. The Anglo girls were lowest, with thirty-six servings per week, and the Spanish-

American boys were highest, with a mean of fifty-one. The Anglos ate more baker's bread, while wheat flour tortillas was the principal bread of the Spanish-Americans.

At the time of the study, New Mexico had no law providing for the enrichment of flour and bread, but much of the baker's bread, which was supplied by large chains, was enriched. Wheat flour tortillas were usually made of unenriched flour. Most breakfast cereals were of the ready-to-eat kind. Oatmeal was the usual hot cereal. Spaghetti, rice, macaroni, and noodles were eaten often by all subjects.

Sweets, including cake, cookies, candy bars, and soft drinks, were used liberally by these teen-agers. The Anglo boys and girls had an average of forty-nine servings a week and the Spanish-Americans thirty-three. The noticeably smaller consumption of these foods by the Spanish-Americans still in elementary school is partly explained by the fact that candy and soft drinks were sold at the high school. Also, more high school students ate lunch away from home. About 80 per cent of the soft drinks were of the cola type.

FATS

The Anglo subjects consumed more fat than the Spanish-Americans, and the types of fat differed in the two groups. The Anglo boys and girls had sixteen and eleven servings, respectively, of butter or margarine a week and the Spanish-Americans, five. The higher consumption of milk, milk products, and meat added additional fat. On the other hand, the Spanish-Americans used a relatively large amount of fat (usually lard) in frying tortillas and beans.

DIETARY SUPPLEMENTS AND LAXATIVES

Thirteen subjects reported taking or having taken dietary supplements of some kind. However, only four reported such supplements on the food records. These four took multiple vitamin or vitamin and mineral preparations.

Almost half (49 per cent) of the whole group reported taking laxatives more or less regularly. The habit was more common among the Spanish-Americans for whom a weekly laxative appeared to be routine practice, but 29 per cent of the Anglos took them frequently, also. Only two subjects reported taking mineral oil.

Intake of Essential Nutrients

For calculation of the intakes of essential nutrients, each subject kept, for seven days, a detailed daily record of all food eaten, including vitamin and mineral supplements. Servings were recorded in terms of ordinary household measures. The records were mailed each day to the nutritionist, who checked them and asked the subject about questionable items. The records were summarized, total intakes of various foods expressed in terms of pounds per week, and the values calculated for calories, protein, carbohydrate, calcium, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid from the master food value cards supplied by the Diet Appraisal Section, Household Economics Research Branch, United States Department of Agriculture plus additional cards prepared by the University of California (6). Fat values were calculated from the calories that remained after protein and carbohydrate calories had been deducted.

Dietary records of the types used in this study are subject to considerable error, but for survey purposes, they do yield valuable information. In this study, it was evident that some subjects were unable to judge sizes of servings. Some failed to record whether they had had sugar on cereal or butter on bread. The composition of some prepared dishes could only be guessed. Nevertheless, even allowing for considerable error, it is clear that, judged by our present knowledge of nutrition, the diets of the Spanish-Americans were less adequate than those of the Anglos in most respects.

As expected, significant differences were found between boys and girls for many nutrients. The mean intakes of the Anglo subjects were significantly higher than those of the Spanish-Americans for energy, protein, fat, calcium, thiamine, and riboflavin. Differences in the intakes of other nutrients were not statistically significant, but were higher for the Anglos for every factor except iron, which was slightly higher for the Spanish-Americans. These data have been summarized in Tables 2 and 3. The data on nutrient intakes were reclassified according to age group (fourteen, fifteen, and sixteen years of age) for comparison with the recommended allowances (7). Figures 1 and 2 show how well these adolescents met these allowances.

CALORIES

The caloric intakes of the Spanish-Americans were lower than those of the Anglos in all comparisons. The mean energy intake was 2563 calories for all boys and 2131 for all girls, but the Spanish-American boys averaged only 2370 calories compared with 2892 calories for the Anglo boys. Intakes of the Anglo and Spanish-American girls were 2233 and 2070 calories, respectively.

In terms of the recommended allowances, the girls' diets were better than the boys', and the younger boys' better than the older boys'. When the records were classified by age groups, 40 per cent of the Anglo and 9 per cent of the Spanish-American fourteen- and fifteen-year-old boys met or exceeded the recommended allowances, but 20 per cent of the Anglo and 37 per cent of Spanish-Americans had less than two-thirds of this amount.

TABLE 2 **Mean and standard error for daily intakes of energy and six nutrients**

SUBJECTS	NUMBER OF SUBJECTS	ENERGY	PROTEIN		FAT	CARBOHYDRATE	CALCIUM	IRON
			Total	From animal sources				
				Boys				
		calories/day	*gm./day*	%	*gm./day*	*gm./day*	*mg./day*	*mg./day*
Spanish-American	46	2370±100	77±3.5	52	93±4.6	302±13.0	843±50.6	16.6±0.76
Anglo	27	2892±140	101±5.0	70	119±5.7	353±22.0	1411±99.6	15.1±0.88
Total	73	2563± 87	86±3.2	58	86±3.2	328±12.1	1053±58.3	16.0±0.58
				Girls				
Spanish-American	61	2070± 85	68±2.0	55	80±3.9	273±12.0	792±52.6	13.2±0.63
Anglo	36	2233± 94	73±3.3	69	93±4.3	271±12.6	989±68.8	11.5±0.60
Total	97	2131± 65	70±2.2	60	85±3.0	273±8.9	865±42.7	12.6±0.46
				All Subjects				
Spanish-American	107	2199± 66	72±2.3	54	86±3.0	291± 9.3	814±37.1	14.7±0.51
Anglo	63	2516± 90	85±3.4	69	104±3.8	306±12.9	1170±63.4	13.1±0.56

None of the sixteen-year-old boys met the recommended allowances, and 31 per cent of the Anglos and 70 per cent of the Spanish-Americans had less than two-thirds of the recommended amount. In view of the margin of safety provided by the recommended allowances, this does not necessarily indicate malnutrition.

The diets of the older boys were less adequate in calories than those of the younger ones, but the reverse was true of the girls. One-fourth of the fourteen- and fifteen-year-old girls of both groups met or exceeded the recommended allowances. This increased to 50 per cent for the sixteen-year-old Anglo girls and remained the same for the Spanish-American girls of the same age. Ten per cent of the Anglo and 34 per cent of the Spanish-American younger girls failed to have two-thirds of the recommended allowances. Among the sixteen-year-old girls, one-fourth of the Spanish-American and 6 per cent of the Anglo subjects had less than two-thirds of this amount.

PROTEIN

The mean protein intake of all boys was 86 gm.; of all girls, 70 gm.; of all Anglos, 85 gm.; and of all Spanish-Americans, 72 gm. The mean protein intakes of the Anglo boys and girls were 101 and 73 gm., compared with 77 and 68 gm. for the Spanish-American boys and girls.

All the Anglo boys in both age groups had at least two-thirds of the recommended amount of protein, and 80 per cent of the younger boys and more than half of the older ones met or exceeded this amount. On the other hand, one-fifth of the Spanish-American boys in both age groups had less than two-thirds of the recommended amount, while none of the older boys and less than one-tenth of the younger ones had 100 per cent of the recommended amount.

Thirty-one and 29 per cent of the fourteen- to fifteen- and sixteen-year-old Spanish-American girls, respectively, failed to meet two-thirds of the recommended allowances as compared with 10 and 12 per cent of the Anglo girls. Twenty-eight per cent of the younger Spanish-American girls met or exceeded the recommended amounts, and this increased to 39 per cent for the older girls. Among the Anglo girls, 35 per cent of the younger and 44 per cent of the older girls met or exceeded these recommendations.

Approximately 70 per cent of the protein in the Anglo dietaries and a little more than 50 per cent in the Spanish-American came from animal sources. Dried beans furnished much of the protein for most of the Spanish-American subjects. Wheat, in flour tortillas, was the principal cereal.

CALCIUM

Low calcium intakes were common, especially among the Spanish-American subjects. The Anglo boys had highest intakes, with a mean of 1346 mg.; the lowest were those of the elementary school Spanish-Americans, with a mean intake of 633 mg. Over 60 per cent of all the Spanish-Americans had less than two-thirds of the recommended allowances of calcium. Except for the sixteen-year-old boys, the boys in both culture groups more nearly met the recommended allowances than the girls. In all comparisons, the younger subjects were better than the older.

The increasing use of wheat flour tortillas or baker's bread, instead of tortillas made of lime-treated corn has removed an important source of calcium from the Spanish-American dietaries.

IRON

Iron was the one nutrient in which the Spanish-American diets were generally superior to the Anglo. This was due to a liberal use of pinto beans. The mean intake of the Spanish-Americans ranged from a high of 16.7 mg. for the high school boys to a

TABLE 3 **Means and standard errors for daily intakes for five vitamins**

SUBJECTS	NUMBER OF SUBJECTS	VITAMIN A	THIAMINE	RIBOFLAVIN	NIACIN	ASCORBIC ACID
			Boys			
		I. U./day	*mg./day*	*mg./day*	*mg./day*	*mg./day*
Spanish-American	46	6435±769.6	1.2±0.06	1.8±0.09	14.0±0.75	73±4.7
Anglo	27	6926±834.6	2.0±0.52	3.0±0.32	17.6±2.14	82±9.8
Total	73	6616±575.5	1.5±0.20	2.3±0.15	15.4±0.94	76±4.7
			Girls			
Spanish-American	61	5033±455.8	1.1±0.05	1.6±0.09	12.3±0.52	65±4.7
Anglo	36	5222±670.3	1.1±0.07	1.9±0.11	12.7±0.75	74±8.3
Total	97	5103±397.0	1.1±0.04	1.7±0.07	12.4±0.43	68±4.3
			All Subjects			
Spanish-American	107	5636±439.0	1.1±0.04	1.7±0.06	13.0±0.44	68±3.3
Anglo	63	5952±534.7	1.5±0.23	2.3±0.17	14.8±1.06	78±6.3

low of 13.0 for the high school girls, compared with means of 15.1 and 11.5 mg. for the Anglo boys and girls. However, differences between the Spanish-American and Anglo groups were not statistically significant. In spite of the relatively high iron intake of the Spanish-Americans, more than a third of the Spanish-American girls and almost 10 per cent of the younger boys failed to have two-thirds of the recommended allowances.

VITAMINS

The Anglo subjects had higher intakes of *vitamin A* than the Spanish-Americans, but differences were not statistically significant. However, much of the vitamin A value of the Spanish-American dietary came from vegetable sources, so the difference between the two groups may be greater than the data indicate. The mean vitamin A intakes ranged from a low of 3667 I.U. for the Spanish-American grade school girls to a high of 6926 I.U. for the Anglo boys.

A larger percentage of the boys than the girls had at least two-thirds of the recommended allowances. The younger boys had better diets than the older and the older Spanish-American girls better than the younger ones, but older Anglo girls did not show improvement over the younger.

The mean *thiamine* intake for all subjects was 1.2 mg., with significant differences between boys and girls and Spanish-Americans and Anglos. Again, the lowest values were those of the Spanish-American grade school girls, with a mean of 1.0 mg. and the highest, those of the Anglo boys, with a mean of 2.0 mg. All boys had a mean intake of 1.5 mg. and all girls, 1.1. For most groups, the thiamine intake was slightly in excess of 0.5 mg. per 1000 calories.

When considered in terms of the recommended allowances, the girls' diets were generally better than the boys', the younger boys' better than the older, and the older girls' better than the younger.

Mean *riboflavin* intakes ranged from 1.3 to 3.0 mg. Again, the Spanish-American grade school girls had the lowest intake and the Anglo boys the highest. The mean for all Anglos was 2.3 mg., compared with 1.7 mg. for all Spanish-Americans.

All the younger Anglo boys and 60 per cent of the older ones had at least two-thirds of the recommended amounts of riboflavin, and 73 and 54 per cent of these groups exceeded that amount. In contrast, 31 and 30 per cent of the Spanish-American boys failed to have two-thirds of the recommended amount and only 29 per cent of the younger and none of the older ones had this amount. About one-fifth of all Anglo girls had less than two-thirds of the allowance, compared with a little over one-third of the Spanish-American girls.

Mean *niacin* intakes among the groups ranged from a low of 12.2 mg. for the Spanish-American high school girls to a high of 17.6 mg. for the Anglo boys. The mean intake for all boys was 15.4 mg. and for all girls, 12.4 mg.

When compared with the National Research Council's recommended allowances, 29 per cent of the Spanish-American and 13 per cent of the Anglo fourteen- to fifteen-year-old boys had less than two-thirds of the recommendation. Even more of the older boys were deficient. Sixty per cent of the Spanish-American and 31 per cent of the Anglo sixteen year-old boys had two-thirds of the allowance.

Ascorbic acid intakes were very irregular, and lack of ascorbic acid-rich foods was common in all groups. The boys had higher intakes than the girls, and the Anglos higher intakes than the Spanish-Americans, but mean differences were not statistically significant. Less than one-fifth of all subjects had as much as 100 mg. daily and almost half had less than 60 mg. The mean intake of all Anglos was 78 mg., of all Spanish-Americans 63 mg.

Summary and Conclusion

The meal patterns, home production and preserva-

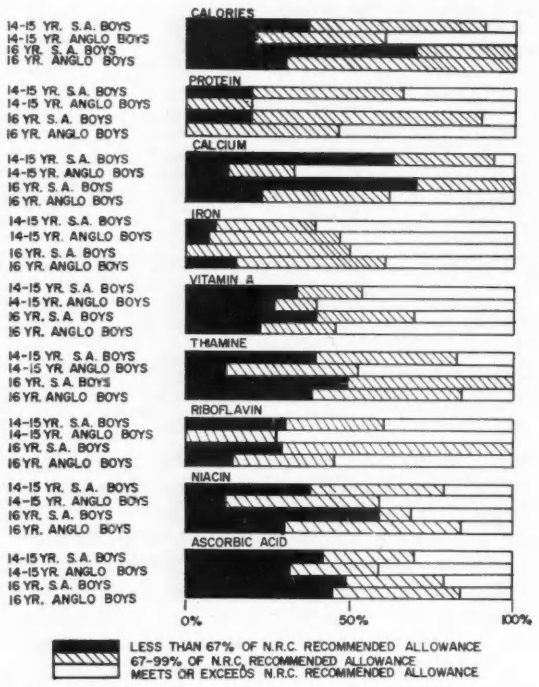

FIG. 1. *Nutrient intake of Spanish-American and Anglo boys in terms of Recommended Dietary Allowances.*

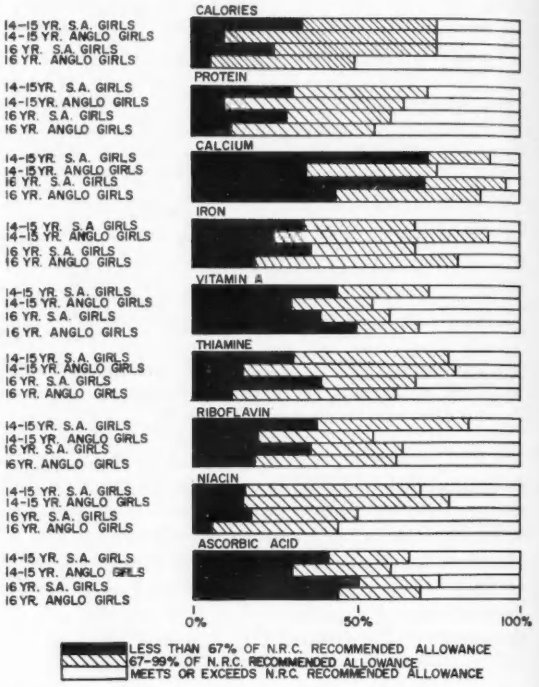

FIG. 2. *Nutrient intake of Spanish-American and Anglo girls in terms of Recommended Dietary Allowances.*

tion of food, and other factors affecting the nutrient intakes of a group of 170 Spanish-American and Anglo adolescents from a community in northern New Mexico have been discussed.

From the data shown and according to our present knowledge of what constitutes an adequate diet, the Anglo boys and girls had better diets than the Spanish-Americans. The Spanish-American dietaries were relatively limited in variety and amount of foods. Consumption of such protective foods as milk, ascorbic acid-rich foods, and animal protein was low. On the credit side, consumption of sweets, especially candy and soft drinks, was relatively low.

Calculation of intakes of essential nutrients showed that many participants in both groups were getting less than optimum amounts of important food nutrients. Deficiencies of calcium and ascorbic acid were particularly evident, although for some groups thiamine and niacin were as low or lower.

Intakes of energy and all nutrients measured, except iron, were lower for the Spanish-Americans and differences were statistically significnt for calories, protein, fat, calcium, and riboflavin. The protein intake of the Spanish-Americans was poor in quality as well as quantity, as much of it came from vegetable sources.

Their limited dietaries explain the lower intakes of essential nutrients and generally less satisfactory physical condition of the Spanish-American participants when compared with their Anglo classmates. The lower intakes of concentrated sweets is of interest in relation to the low incidence of dental caries among the Spanish-Americans. These will be discussed in another report.

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II. Blood Findings, Height and Weight Data, and Physical Condition

Nutrition of New Mexican Spanish-American and "Anglo" Adolescents[1]

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Spanish-Americans had lower serum cholesterol values, lower weight, and less dental caries. Anglo adolescents had higher mean serum carotene, higher hemoglobin and red cell counts, as well as greater height and weight.

ACCORDING TO data presented in Part I of this study (1) of approximately 170 adolescents in a community in northern New Mexico, the dietaries of the "Spanish-American" boys and girls were qualitatively and quantitatively less adequate than those of their "Anglo" classmates. The Spanish-American diets were limited in variety and amounts of foods and the consumption of the protective foods was low. Much of the protein and vitamin A came from vegetable sources.

Calculation of the intakes of essential nutrients showed that many participants in both groups were eating less than the optimum amounts of essential food nutrients. Deficiencies of calcium and ascorbic acid were particularly evident. Intakes of energy and all nutrients measured, except iron, were lower for the Spanish-Americans, and differences were statistically significant for energy, protein, fat, calcium, and riboflavin.

The present report is concerned with blood analyses, height and weight data, and physical examinations of these teen-agers.

Methods

Except for levels of nutrition so low that obvious symptoms of deficiency exist, it is difficult to measure nutritional status. Low levels of nutrients in blood are usually the result of inadequate dietary intakes over a relatively long period. On the other hand, temporary high levels may be found after ingestion of food. Nevertheless, many surveys of different population groups have helped to define ranges usually found in so-called "normal" people.

In this survey, the students reported to the laboratory without breakfast if their appointments were in the forenoon or without lunch if they were in the afternoon. No appointments were made before 9 a.m. or 2 p.m., and the blood sample followed the physical examination. By that time, the level of most nutrients had returned to fasting levels.

Approximately 20 ml. blood were taken by venipuncture. Blood counts, hematocrit readings, hemoglobin, sedimentation rate, blood glucose, and serum ascorbic acid were determined at once in the trailer laboratory that accompanied the research team. Portions of serum were frozen for later determinations of riboflavin, carotene, vitamin A, and cholesterol.

ANALYTICAL METHODS

The analytical methods were the same used in other phases of the regional project. Red and white cell counts were made by standard clinical procedures. A blood smear was stained with Wright's

[1]This study was part of the Western Regional Research Project on the Nutritional Status of Population Groups in the West. The New Mexico phase was under the direction of the New Mexico Agricultural Experiment Station. The investigation was financed in part by funds appropriated under the Research and Marketing Act of 1946. The cooperation and assistance of the Human Nutrition Research Division, U. S. Department of Agriculture and the U. S. Public Health Service are acknowledged. The technical assistance of George De Young, M.D., Stella Peeks, May Bay, John Barnwell, Mildred Snowden, Donna Harbison, Mariana Kulas, Ellen Morse, James Moody, Mae Martha Johnson, and Maurice Finkner is acknowledged. Journal Series No. 111, Agricultural Experiment Station, New Mexico College of Agriculture and Mechanic Arts. Received for publication June 10, 1957.

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TABLE 1 **Mean and standard error of whole blood constituents**

SUBJECTS	NUMBER OF SUBJECTS	HEMOGLOBIN	VOLUME PACKED RED CELLS	RED CELL COUNT	WHITE CELL COUNT	SEDIMENTATION RATE	GLUCOSE
			Boys				
		gm./100 ml.	*%*	*millions/cmm.*	*thousands/cmm.*	*mm./hr.*	*mg./100 ml.*
Spanish-American	49	14.1±0.17	48±0.5	5.03±0.10	8.40±0.29	10.4±1.1	93±1.2
Anglo	28	15.2±0.20	51±0.5	5.45±0.09	8.86±0.38	10.3±1.5	90±1.2
Total	77	14.5±0.10	49±0.4	5.2 ±0.07	8.56±0.23	10.5±0.9	93±0.8
			Girls				
Spanish-American	59	13.5±0.14	46±0.3	4.74±0.06*	8.90±0.25*	17.2±1.1	93±1.3†
Anglo	37	13.8±0.20	47±0.5	4.87±0.09	8.85±0.35	12.4±1.4	90±1.1
Total	96	13.6±0.10	46±0.3	4.80±0.06*	8.88±0.19	15.3±0.9	91±0.8†
			All Subjects				
Spanish-American	108	13.8±0.10	47±0.3	4.9±0.06*	8.67±0.18*	14.1±0.9	94±0.8†
Anglo	65	14.4±0.15	49±0.4	5.1±0.07	8.85±0.16	11.5±1.1	90±0.8

*One value missing.
†Two values missing.

stain and examined for the presence of abnormal cells.

Hemoglobin was determined as alkaline hematin (2) using a Leitz photoelectric colorimeter calibrated for hemoglobin by the oxygen capacity method. *Hematocrit* readings (per cent volume of packed red cells) and *sedimentation rate* were determined by the method of Wintrobe (3) and Wintrobe and Landesberg (4).

Serum protein was determined by the specific gravity method of Phillips *et al,* (5).

Glucose was determined by the Miller and Van Slyke method (6).

Ascorbic acid, riboflavin, carotene, and vitamin A were determined by the micromethods devised by Bessey and co-workers for use in mass surveys (7-10). *Cholesterol* was determined by the method of Schoenheimer and Sperry (11).

Findings

HEMOGLOBIN, HEMATOCRIT READINGS, AND RED CELL COUNTS

Hemoglobin, hematocrit readings (per cent volume of packed red cells), and red blood cell counts are widely used indices of health and nutritional condition. The values found in this study are shown in Table 1. They are in general agreement with those found by other investigators in mass surveys (12-14). While high altitudes are reported to cause increased values in hemoglobin, hematocrit, and red blood cell values, the levels for these subjects living about 6500 ft. above sea level are not higher than found in other subjects in the same age group at lower elevations. The mean hemoglobin value of these subjects was 14.5 gm. per 100 ml. for boys and 13.6 gm. for girls.

TABLE 2 **Coefficients of correlation**

CORRELATIONS	TOTAL	SPANISH-AMERICANS	ANGLOS	BOYS	GIRLS
Blood ascorbic acid vs. dietary ascorbic acid	.371**	.312**	.435**	.506**	.288
Blood ascorbic acid vs. blood vitamin A	.095	.056	.114	.116	.110
Blood vitamin A vs. dietary vitamin A	.182*	.097	.281*	.154	.167
Blood vitamin A vs. blood carotene	.236**	.202*	.277*	.250*	.248*
Blood glucose vs. dietary carbohydrate	.055	.078	.100	—	—
Hemoglobin vs. dietary protein	.326**	.206*	.373**	.322*	.139
Hemoglobin vs. dietary iron	.124	.160	.179	—	—
Hemoglobin vs. blood ascorbic acid	.017	.091	.004	.073	.030
Dietary protein vs. height	.404**	.247**	.431**	.355**	.185
Serum protein vs. sedimentation rate	.153*	.157	.283*	.200	.045
Gingivitis (Spanish-American) vs. blood ascorbic acid	.064	—	—	—	—
Gingivitis (Spanish-American) vs. dietary ascorbic acid	.028	—	—	—	—
Sedimentation rate vs. temperature	.113	—	—	—	—
Vascularity of bulbar conjunctiva vs. blood riboflavin	.040	—	—	—	—
Vascularity of bulbar conjunctiva vs. dietary riboflavin (Spanish-American)	.138	—	—	—	—

*Significant at the 5 per cent level.
**Significant at the 1 per cent level.

In spite of the slightly higher iron intake of the Spanish-Americans, the Anglos had higher hemoglobin values, higher hematocrit values, and higher red cell counts. This was true of both boys and girls as shown in Figure 1. No Anglo girl had a hemoglobin value below 12 gm. or hematocrit reading below 42, while 8.5 and 5 per cent of the Spanish-American girls had values below these points. Similarly, no Anglo boy had a hemoglobin value below 13 gm., and over half had values above 15 gm., while one-fifth of the Spanish-American boys had values below 13 and only a little more than one-fourth were above 15 gm.

Though iron is essential for maintenance of satisfactory hemoglobin and red blood cell levels, the importance of good quality protein and vitamins cannot be ignored (15).

When the relation of the intakes of various nutrients to blood values was studied, positive correlations between dietary protein and hemoglobin were found for the entire group for both cultures and both sexes, with correlation coefficients ranging from .139 to .373. Positive, but lower and statistically insignificant, correlation coefficients were found for dietary iron and hemoglobin and dietary ascorbic acid and hemoglobin. These data are shown in Table 2.

SEDIMENTATION RATES, LEUCOCYTES, AND ABNORMAL CELLS

Sedimentation rates are increased in certain acute or chronic infections, but may be high when other laboratory tests are negative and clinical signs of illness are absent. Girls have generally higher sedimentation rates than boys, and their rates are further increased during menstruation. Sedimentation rate may be increased also by emotional stress (16). Some subjects were afraid of the examinations.

Higher than normal sedimentation rates were found in many of the subjects. Differences between Spanish-Americans and Anglos were not significant. Thirty per cent of the boys and 27 per cent of the girls had rates above the 12 and 20 mm., usually considered normal. A few subjects had colds or sore throats when they reported for examination. Of those with high sedimentation rates, four had elevated body temperatures (99.0°—99.8°F.), but there was no correlation between temperature and sedimentation rate. Three subjects had abdominal tenderness, which was diagnosed at the time of examination as sub-acute appendicitis. Thirteen had histories of frequent sore throats and/or ear pain, one had a running ear, and one a history of joint pains. Forty had enlarged inguinal lymph nodes.

The mean leukocyte count of the individuals in this study ranged from 5,000 to 15,000 with a mean of 8,700 and a median of 8,500. The twenty-three values above 10,000 were not limited to any particular group, and mean differences between groups were not significant.

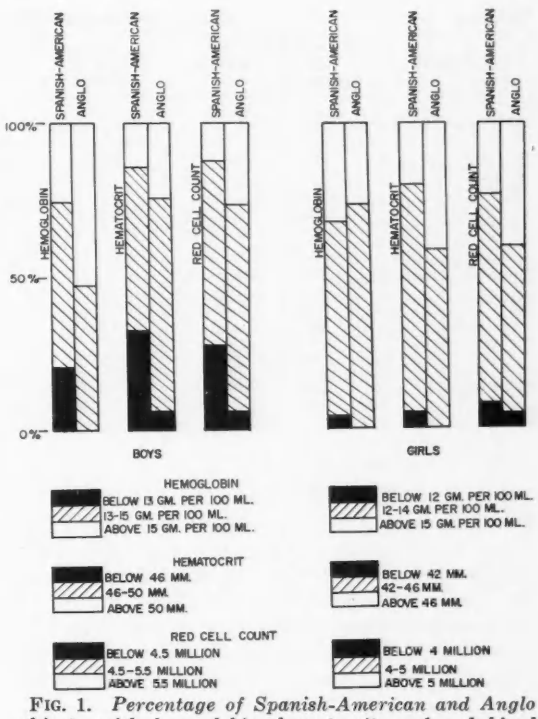

FIG. 1. *Percentage of Spanish-American and Anglo subjects with hemoglobin, hematocrit, and red blood cell values at given levels.*

A stained blood smear was examined for abnormal cells. Anisocytosis was reported for nine subjects and poikilocytosis for four. These were not confined to any particular group. In four cases, anisocytosis was associated with a hemoglobin value below 12 gm. per 100 ml.

BLOOD GLUCOSE

The values for blood glucose were all within the normal range, but the Spanish-Americans had slightly higher values than the Anglos. The only two values above 110 mg. were in Spanish-American subjects. Failure to understand the request to omit breakfast (or lunch) before the examination may account for some of the relatively high values, though fear of the examination may have caused an emotional hyperglycemia in some.

SERUM NUTRIENTS

The values for serum protein, carotene, vitamin A, riboflavin, ascorbic acid, and cholesterol are shown in Table 3. As in the case of dietary intakes, significant differences in means for some nutrients were found between boys and girls and between Spanish-Americans and Anglos.

The mean *serum protein* value for all subjects was 6.4 gm. per 100 ml. serum; for all Anglos, 6.5; and

TABLE 3 **Mean and standard errors of blood serum constituents**

SUBJECTS	NUMBER OF SUBJECTS	PROTEIN	ASCORBIC ACID	CAROTENE	VITAMIN A	RIBOFLAVIN		CHOLESTEROL
						Free	Total	
Boys								
		gm./100 *ml.*	*mg.*/100 *ml.*	*mcg.*/100 *ml.*	*mcg.*/100 *ml.*	*mcg.*/100 *ml.*	*mcg.*/100 *ml.*	*mg.*/100 *ml.*
Spanish-American	48	6.2±.06	0.7±.07†	105± 7†	30±1.2*	0.73±.07‡	3.2±.08‡	152±4‡
Anglo	28	6.4±.07	0.8±.09	121±16	36±1.5	1.06±.10	3.6±.13†	173±6
Total	76	6.3±.04	0.8±.06†	111±10†	32±1.0*	0.86±.06	3.4±.07‖	160±4‡
Girls								
Spanish-American	58	6.3±.05	0.8±.07*	110± 5†	29±1.2*	0.98±.08*	3.4±.09*	164±3
Anglo	36	6.6±.06	0.9±.08	123±14	28±1.9	0.94±.10*	3.4±.09†	187±7*
Total	94	6.4±.04	0.8±.05*	115± 8†	28±1.0*	0.96±.06†	3.4±.07‡	173±4*
All Subjects								
Spanish-American	106	6.3±.08	0.8±.05‡	108± 8#	29±0.8†	0.87±.06#	3.3±.06#	158±2‡
Anglo	64	6.5±.04	0.9±.06	122±11	32±1.4	0.99±.07*	3.5±.08#	181±5*

*One value missing.
†Two values missing.
‡Three values missing.
#Four values missing.
‖Five values missing.

for all Spanish-Americans, 6.3. Values ranged from 5.2 to 7.4 gm., with 17.6 per cent of all values below 6.0 gm. Ten per cent of the Anglo subjects had values below 6.0 compared with 21.7 per cent of the Spanish-Americans. In line with the relatively higher protein intake of the girls, the mean serum protein value for girls was higher than that of the boys in all groups.

Sex and age, as such, have little or no effect on serum protein values of children. In a study of 390 children, two to eighteen years of age, the mean of all fasting blood serum protein values was 7.0 gm. per 100 ml. with values ranging between 6.0 and 8.6 gm. (17). Therefore, the relatively low serum protein values found in some of the New Mexican subjects suggest less than optimum nutrition.

The mean *serum carotene* for all subjects was 113 mcg. per 100 ml. The mean for all Spanish-Americans was 108 and for all Anglos 122. The difference was statistically significant. Thirty-nine per cent of the Anglos had values above 125 mcg., compared with 12.7 per cent of the Spanish-Americans. Only one Anglo and two Spanish-Americans had carotene levels above 200.

The *vitamin A* picture was much the same, although the difference between means of the two groups was not statistically significant. The mean for all subjects was 30 mcg. per 100 ml., for all Anglos 32, and for all Spanish-Americans 29. Sixty-one per cent of the Anglos and 47 per cent of the Spanish-Americans had values above 30. Two Anglos had values above 50 mcg., considered excellent by Bessey and Lowry (18), but no Spanish-American in the study fell into this group.

Serum ascorbic acid values were generally low in all groups. While the mean level was somewhat higher in the Anglo subjects than in the Spanish-Americans, the difference was not significant, and there was no difference between boys and girls.

The mean serum ascorbic acid value for all subjects was 0.81 mg. per 100 ml. Fifty-one per cent had values below 0.5 and 63 per cent below 1.1 mg. Serum ascorbic acid values change quickly with fluctuations in intake. For survey purposes, a serum ascorbic acid level below 0.6 mg. per 100 ml. is usually considered borderline and 0.4 mg. definitely abnormal. Values of 0.4 mg. or below probably indicate long continued inadequate consumption of the vitamin.

This survey was made in late spring and early summer, when sources of ascorbic acid were relatively abundant. In a later survey made during the winter in three widely separated areas in New Mexico, some children had no ascorbic acid in their serum (19).

Total *serum riboflavin* values ranged from less than 2 to 5.4 mcg. per 100 ml., with a mean for all subjects of 3.4. The mean for all Anglos was 3.5; for all Spanish-Americans, 3.3; and for both boys and girls, 3.4. The free riboflavin values followed the same pattern, with a mean of 0.9 mcg. for all subjects.

In a study of plasma riboflavin determined at intervals in a group of ninety-two children over a period of five years, Bartlett (20) concluded that a normal basal level for total riboflavin is approximately 3.5 mcg.; that high values are temporary, and, like free riboflavin values, indicate the amounts consumed before sampling. Therefore, plasma (or serum) riboflavin levels do not reflect nutritional status.

Spanish-American subjects had significantly lower *serum cholesterol* values (both free and total) than the Anglos. This was true of the group as a whole and of the Anglo and Spanish-American high school groups. No Spanish-American had a free cholesterol value above 60 mg. per 100 ml. or a total

TABLE 4 **Heights and weights of Spanish-American and Anglo boys**

HEIGHT IN INCHES	WEIGHT IN POUNDS																						TOTAL
	70-74	75-79	80-84	85-89	90-94	95-99	100-104	105-109	110-114	115-119	120-124	125-129	130-134	135-139	140-144	145-149	150-154	155-159	160-164	180-184	185-189	190-194	210-214	
Spanish-American																								
58		1																						1
59	1	1	1	1																				4
60				1	1																			2
61					1	1																		2
62					1	2		1	2															6
63						1	7			1														9
64				1		1		1			2			1										6
65								2		2	1													5
66							1				1													2
67								3		2		1												6
68													1											1
69								1	1			1				1	1							5
70																								0
71																								0
72																		1						1
73																		1						1
Total	1	2	1	3	3	5	8	8	3	5	4	2	1	1		1	1	2						51
Anglo																								
65											1													1
66										2														2
67												1	1											2
68											3		1	1	1		1							7
69										1	1		1	2	1		1				1			8
70														1	1								1	3
71											1				1	1		1						4
72																								0
73																	1							1
Total										3	6	1	3	4	4	1	3	1			1		1	28

above 230 mg., while 11 and 13 per cent of the Anglos had free and total values above these levels. Mean values for the Spanish-Americans were 30 and 158 mg., compared with 45 and 181 for the Anglos.

These data are of particular interest because of the current interest in the effect of restricted caloric intake on serum cholesterol levels. Low cholesterol values were found in the Papago Indian children studied in the Arizona phase of the regional survey (21). Like the Spanish-Americans of New Mexico, the Papagos have relatively low caloric intakes and diets low in animal protein and dairy products. Lard is the principal fat for both groups.

The total mean fat intake of the Anglo and Spanish-American subjects amounted to 104 and 86 gm., respectively (1). The Anglos had more fat from meat, milk, and milk products, while the Spanish-Americans used relatively large amounts of fat, usually lard, to fry tortillas and beans.

The girls had significantly higher cholesterol values than the boys. This sex difference has been found in several age groups (22), although Keys *et al.* (23) found no sex difference.

Physical Signs of Nutritional Deficiency

Diet surveys and blood analyses show the condition of the subjects at the time the survey is made. The nutritional condition of an individual is the result of dietary intake over a long period of time. Dietary deficiencies during infancy or childhood may become apparent through clinical symptoms many years later and are often of the mild chronic type. The rapid growth that occurs during adolescence may lead to the first appearance of symptoms. Severe symptoms of malnutrition are seldom found in this country, but chronic, mild symptoms are believed by many investigators to be prevalent (24).

Except for gingivitis and increased vascularity of the bulbar conjunctiva, there were few physical signs of nutritional deficiency in this survey. Both of these conditions are relatively common in New Mexico (19). "Mild" or "moderate" gingivitis was reported for forty-three or a little less than one-fourth of all subjects in this Las Vegas survey. Almost half had increased vascularity of the bulbar conjunctiva. The incidence and severity of both of

TABLE 5 **Heights and weights of Spanish-American and Anglo girls**

INCHES IN HEIGHT	WEIGHT IN POUNDS																		TOTAL
	70-74	75-79	80-84	85-89	90-94	95-99	100-104	105-109	110-114	115-119	120-124	125-129	130-134	135-139	140-144	150-154	180-184	190-194	
Spanish-American																			
50			1																1
51																			0
52																			0
53																			0
54																			0
55																			0
56																			0
57					1	1													2
58	1	1	1										1						4
59			1	1	2		1												5
60					2	4		1		1									8
61			1	1	4	2	3	1	3										15
62						1	2	2	3	3									11
63							2	3						1					6
64								1			1						1	1	4
65								1					1						2
66												1			1				2
67															1				1
68								1											1
Total	1	1	4	2	9	8	8	10	6	4	1	1	2	1	2		1	1	62
Anglo																			
59									1		1								1
60						1			1										2
61								1								1			2
62				1			1	2	1										5
63					1			1	1		2				1				6
64							1	3	1	2									7
65								1		1	2			1					5
66											2						1		3
67									3	1									4
68																			0
69															1				1
70										1									1
Total				1	1	1	2	8	7	5	7			1	2	1	1		37

these conditions was higher among the Spanish-Americans than among the Anglos.

Dental Caries

Selective Service records in both world wars show that the teeth of registrants from New Mexico were unusually free from dental caries (25). The cause of dental caries is not entirely clear, but dietary factors play an important role. Fluorine exerts a protective effect against dental decay. The fluoride content of the domestic water supply of many localities in New Mexico is relatively high, but repeated analyses of the water supply of Las Vegas at all times of the year have never shown more than a trace of fluorine (26). Low fluoride values were found in several private water supplies in the vicinity.

Dental examinations by the project physician indicated a very low incidence of dental caries in all subjects. The mean number of decayed, missing, or filled teeth (DMF) of the Spanish-Americans was 1.9, while that of the Anglos was 4.7. Rural Anglo subjects had lower DMF rates than the urban, but this was not true of the Spanish-Americans. As noted in the first paper (1), the Anglos consumed more sweets and soft drinks than the Spanish-Americans.

As a follow-up of this study, detailed dental examinations of 860 college students from all parts of New Mexico have been made by dentists of the New Mexico Department of Public Health. Water samples from farms, ranches, and other private sources have been analyzed for fluorine, and these data (with fluorine contents of municipal water supplies which were already available) will be used in analysis of the dental data. Study of the data

TABLE 6 Mean heights and weights of subjects at different ages

AGE	SPANISH-AMERICAN			ANGLO		
	Number	Height	Weight	Number	Height	Weight
	Boys					
		in.	*lb.*		*in.*	*lb.*
14 years	18	62.1	97.1	4	67.8	132.8
15 years	21	64.5	108.9	11	69.3	138.4
16 years	10	68.1	129.4	13	68.6	139.7
	Girls					
14 years	14	61.0	103.4	6	62.3	111.2
15 years	15	61.4	109.7	15	64.3	116.0
16 years	30	61.7	104.0	16	64.3	119.0

has not been completed, but the incidence of dental decay is low.

Height and Weight

The value of the relation of height and weight to age as an index of nutritional condition has been questioned, as both are influenced by many factors (27). Shuttleworth (28, 29) found that during adolescence, height and weight correlate with sexual maturity rather than physiologic age. Heredity also affects height and weight. Nevertheless, height and weight data supplement other information in determining nutritional condition.

The Anglo subjects were taller and heavier than their Spanish-American classmates. This was true for both boys and girls and in both age groups, although differences were more pronounced in the younger boys. The distribution of the subjects according to height and weight is shown in Tables 4 and 5 and differences in height and weight from fourteen to sixteen in Table 6.

The Spanish-American boys ranged from 58 to 73 in. in height and from 70 to 164 lb. in weight, though only five weighed more than 134 lb. The Anglo boys ranged in height from 65 to 73 in. and in weight from 115 to over 200 lb. While the difference in mean heights of the fourteen- and sixteen-year-old Anglo boys was only 0.8 in., that of the Spanish-American boys was 6 in., with corresponding weight differences of 6.9 and 32.3 lb.

The Spanish-American girls were shorter and lighter in weight, ranging in height from 50 to 68 in. and in weight from 80 to 190 lb. with means of 61.5 in. and 105 lb. The shortest Anglo girl was 59 in. and the tallest 70, with a mean of 66 in. Weight of the Anglo girls ranged from 85 to 180 lb.; mean weight was 120 lb. Eighty-five per cent of the Spanish-American and 67 per cent of the Anglo girls weighed less than 120 lb.

The numbers of boys in these groups are too small to justify speculation about the relatively greater change in both height and weight between fourteen and sixteen years of age of the Spanish-American boys, but it does suggest that the adolescent spurt in growth may occur somewhat later in Spanish-American than in Anglo boys.

TABLE 7 Percentage of subjects who were underweight or overweight, according to Baldwin-Wood standards (30)

WEIGHT STATUS	SPANISH-AMERICAN		ANGLO		ALL SUBJECTS	
	Boys	Girls	Boys	Girls	Boys	Girls
	%	%	%	%	%	%
Normal (±)10%	71.4	50.8	71.4	59.4	71.4	54.1
Underweight						
11–20%	20.4	30.5	17.8	21.7	19.4	27.0
21–30%	4.0	6.7	0	5.4	2.5	6.2
30–50%	2.0	1.6	0	0	1.2	1.0
Overweight						
11–20%	2.0	6.7	3.5	2.7	2.5	5.2
21–30%	0	0	0	5.4	0	2.1
30–50%	0	3.2	7.1	5.4	2.5	4.2

TABLE 8 Physical status of Spanish-American and Anglo subjects according to Wetzel Grid channels

WETZEL GRID CHANNEL	SPANISH-AMERICAN				ANGLO			
	Boys		Girls		Boys		Girls	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Obese (A_4A_5)	0	.....	2	3	2	7.1	4	11
Stocky (A_3A_3)	2	4.1	10	17	2	7.1	4	11
Good (A_1MB_1)	21	42.8	34	58	16	57.1	19	51
Fair (B_2)	15	30.6	8	14	4	14.3	6	16
Borderline (B_3)	7	14.3	3	5	4	14.3	3	8
Poor (B_4)	4	8.2	2	3	0	.....	1	3
Total	49		59		28		37	

The girls in both groups seemed to have passed the pre-adolescent growth spurt as there was little change in either height or weight. All of the Anglo and all but four of the Spanish-American girls had passed the menarche. Of these four, one was fourteen years old; two, fifteen; and one, sixteen. The mean age at beginning of menstruation was 12.9 years for the Anglo girls and 13.0 for the Spanish-American girls.

The number of boys and girls who were underweight or overweight for their age and height, according to Baldwin-Wood standards (30), is shown in Table 7. Most of the subjects in both groups fell in the "normal" group—within ± 10 per cent of the standard weight for their height. Of those outside the normal classification, more were underweight than overweight. Seventy-one per cent of both Anglo and Spanish-American boys were of "normal" weight for their height and age, i.e. they did not deviate more than 10 per cent from the Baldwin-Wood standard. Of the remainder, 18 per cent of the Anglos were underweight and 11 per cent were overweight compared with the Spanish-Americans, 27 per cent of whom were underweight and 2 per cent were overweight. Fifty-one per cent of the Spanish-American girls and 59 per cent of the Anglo

girls were within 10 per cent of the normal weight for their height. Twenty-eight per cent of the Anglo girls and 39 per cent of the Spanish-Americans were more than 10 per cent underweight, and 14 per cent and 10 per cent, respectively, were overweight.

The physical status of the subjects according to channel position on the Wetzel grid (31) is shown in Table 8. This standard places most of the subjects in the "good" or "fair" group. More Spanish-American boys than Anglo fell into the "borderline" and "poor" groups, but this was not true of the girls.

While the relatively poor diets and the lower blood nutrient values of the Spanish-Americans suggest that poor nutrition may be responsible for the smaller size of this group, the difference in heredity cannot be ignored. This question is now being studied in this laboratory.

Correlations

Correlation coefficients were determined for certain factors and some interesting relationships were found. Some of these have been shown in Table 2. For example, there were highly significant positive correlations between hemoglobin and dietary protein but not between hemoglobin and dietary iron. Also, height and dietary protein were positively correlated.

Significant positive correlations were found also for dietary and serum ascorbic acid in both culture groups and both sexes, and dietary and blood vitamin A for all subjects and all Anglos, but not for the Spanish-Americans.

No relationship was found between dietary or blood nutrients and gingivitis or increased vascularity of bulbar conjunctiva. A significant positive correlation was found between dietary calcium and DMF in the boys but not in the girls. A negative correlation was found between dietary carbohydrate and DMF in the girls.

Summary and Conclusions

The nutritional condition of fourteen-, fifteen-, and sixteen-year-old boys and girls from a community in northern New Mexico was studied by means of seven-day dietary records, physical examinations, and blood analyses. The subjects included 113 Spanish-Americans and 64 Anglos. This report deals with the blood findings, with some discussion of height-weight data and physical signs of nutritional conditions.

Hemoglobin, volume of packed red cells (hematocrit reading), and red cell counts were significantly lower in the Spanish-American group as were blood glucose, serum carotene, serum protein, and serum cholesterol.

The Spanish-American boys and girls were shorter and lighter in weight than Anglos of the same age. Aside from gingivitis and increased vascularity of the bulbar conjunctiva, there were few physical signs of malnutrition. The incidence and severity of both these conditions were higher among the Spanish-Americans than among the Anglos. The Spanish-American students had a lower incidence of dental caries than the Anglos.

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Amino Acid Metabolism in the Central Nervous System

Six papers, comprising the proceedings of the 13th annual conference on protein metabolism, sponsored by the Bureau of Biological Research of Rutgers University, have been edited by William H. Cole and published under the title, Amino Acid Malnutrition *(New Brunswick, New Jersey: Rutgers University Press, 1957. Paper. Pp. 98. Price $2). Because of the importance of each paper to all investigators in the field of protein metabolism, they will be reviewed separately as space allows. The paper, "Amino Acid Metabolism in the Central Nervous System" by Donald B. Tower, National Institute of Neurological Diseases and Blindness" is reviewed below.*

This is a long and detailed paper, little of which can be presented in a review. It includes data on the concentration of free amino acids in the brain and the protein composition of the brain. It is of interest that about 75 per cent of the total free amino acids of the brain are contributed by members of the glutamic acid-aspartic acid group and less than 5 per cent by the "essential" amino acids. The pathway of metabolism of certain amino acids is presented and the general characteristics of protein metabolism in the brain are discussed. The importance of the glutamic acid-aspartic acid group in cerebral metabolism is emphasized, as is the part of pyridoxine in amino acid metabolism.

Extracts from the author's conclusions state that "no evidence has been cited to suggest that, within the meanings used during this symposium, amino acid malnutrition or protein depletion affects the central nervous system. No clinical signs of neurological dysfunction nor evidence of abnormalities in gross or microscopic examination of the brain have been observed in protein-depleted dogs or children dying of kwashiorkor. It is possible that the central nervous system is preferentially spared under circumstances of amino acid malnutrition and that the barrier mechanism may play a role in this sparing. The intimate association of pyridoxine deficiency and of deranged glutamic acid metabolism with seizures implicates glutamic acid and related compounds in neurological activity and excitablity. The proper maintenance of amino acid and protein metabolism in the central nervous system appears to be essential to the normal economy of the neuron and its metabolic functional activities."—*May S. Reynolds, Ph. D., Professor of Foods and Nutrition, School of Home Economics, University of Wisconsin, Madison.*

II. Cholesterol Content and Fatty Acid Composition

Composition of Turkey Meat[1]

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IN A recent report from this laboratory (1), data were presented on the dressing percentages, protein, fat, and other nutrient composition of the edible portions of raw and roasted turkeys of various varieties and ages as compared with other meats. The breast and leg meats of roasted turkey were shown to rank higher in protein than any of the other cooked meats. The fat content of the breast (white) meat was found to be approximately 7 to 8 per cent, and that of the leg (dark) meat was approximately 11 to 12 per cent of the roasted edible portion.

Recent studies in the field of medical research led by Kinsell (2, 3), Frisky (4), Beveridge (5, 6), Ahrens (7), Malmros (8), and Bronte-Stewart (9) and their associates have presented evidence that the type of fat present in the diet is an important factor in determining the cholesterol levels in the body. Although there is considerable controversy among the workers in this field concerning certain aspects of the relationships between dietary fats, plasma lipids, and coronary heart disease, the following points appear to be fairly well established:

(a) In most cases of coronary heart disease, the blood cholesterol levels have been shown to be higher than normal. This does not mean that all persons showing high blood cholesterol values are in imminent danger of a heart attack, but when the blood cholesterol level is high it is considered a danger signal.

(b) The cholesterol content of the diet of normal men and women has little, if any, influence on the cholesterol level in the blood. Keys (10) and others have shown that, within the limits of the usual cholesterol content of normal diets, the higher cholesterol diets produced no higher blood cholesterol levels in man than the lower cholesterol diets.

It appears that the main source of blood cholesterol is that synthesized within the body and that this synthesis is somehow influenced by the amount and type of fat present in the diet.

(c) Reducing the fat content of the diet to a very low level results in a lowering of the blood cholesterol.

(d) Starting with a low-fat diet, the addition of fats containing a high proportion of unsaturated fatty acids causes no change in the already low blood cholesterol levels under certain experimental conditions.

(e) On the other hand, the addition to the diet of fats containing a high proportion of saturated fatty acids causes a prompt and marked rise in blood cholesterol.

(f) When blood cholesterol is high, it can be reduced by the partial or complete substitution of unsaturated fats.

(g) The earlier idea that "animal" fat raised the blood cholesterol level and that "vegetable" fat reduced the blood cholesterol level is no longer tenable since it has been shown that hydrogenated vegetable fats cause a rise in blood cholesterol.

In view of present interests in this problem, it was considered highly desirable to review information on the degree of unsaturation of the fats in poultry meats as compared with that in other foods. Even though it is not now considered to be of medical importance, it was considered desirable, also, to determine the cholesterol content of turkey meats. Results obtained in this laboratory and a review of recent results from other laboratories are presented in this report. These results show that the cholesterol content of turkey meat is very low as compared with other animal foods and that the degree of unsaturation in turkey (and chicken) fats resembles that in such vegetable fats as cottonseed oil, being much higher in total unsaturated fatty acids and lower in saturated fatty acids than butter or beef tallow.

Cholesterol

The cholesterol content of turkey meats was determined on composite samples of at least three market turkeys of different sex, ages, and varieties. A 5-gm. sample of the vacuum-dried, finely ground composited sample of turkey meat was extracted with peroxide-free ethyl ether. The ether was re-

[1]Received for publication August 16, 1957.

TABLE 1 Cholesterol content of turkey meats and other foods*

FOOD	CHOLESTEROL
	mg./100 gm.
Beef, round steak	125
Liver, beef	320
Pork	70—105
Shrimp	150
Oysters	230—470
Cheeses	140—190
Butter	280
Eggs, whole	468
Chicken	60— 90
Salmon	60
Turkey	
Whole carcass, fresh	45— 50
Breast meat, fresh	8— 15
Leg meat, fresh	16— 26

*All values, except for those for turkey, were taken from Okey (12).

moved from the extract by careful distillation, whereupon the fat was dissolved in reagent grade acetone. The cholesterol analyses were conducted on these acetone solutions by the method of Sperry and Webb (11).

The cholesterol content of all of the turkeys was found to be generally low and within such a narrow range that it was considered necessary to report only the range of values obtained in the analyses. These results are presented in Table 1. A comparison of the cholesterol content of turkey meat with that of a number of other animal foods, according to data by Okey (12), also presented in Table 1, shows that turkey meat is lower in cholesterol content than any of the other foods considered. Chicken, salmon and pork also appear to be relatively low in cholesterol.

Degree of Unsaturation in Turkey Fat

An unsaturated fat readily reacts with iodine, each point of unsaturation in the fat taking up two atoms of iodine in the reaction. Thus, the iodine number of a fat, which is the number of grams of iodine taken up by 100 gm. of fat, is the most useful single measure of the character of a fat. Iodine number determinations were conducted according to the method of Rosenmund and Kuhnhenn (13) on the fats from the same samples of turkey breast and leg meats used in the cholesterol determinations. The values obtained are presented in Table 2.

TABLE 2 Iodine numbers of turkey fats as compared with other food fats*

SOURCE OF FAT	IODINE NUMBER
Butter	25— 42
Lamb	35— 46
Beef	40— 48
Turkey	
Leg	70— 71
Breast	77— 80
Chicken	63— 80
Olive oil	80— 88
Peanut oil	84—100
Cottonseed oil	99—113
Corn oil	103—128

*All values, except for turkey and chicken, taken from "Composition and Constants of Fatty Acids" (17).

The iodine number of 79 for turkey breast fat and 70 for turkey leg fat are much higher than the values for butter, lamb, and beef fat and approach the values for some of the vegetable fats which are universally recognized as "unsaturated fats," meaning that they contain a high proportion of unsaturated fatty acids in the fat.

Klose and associates of the Western Regional Research Laboratory and Kratzer and associates of the University of California (14) collaborated in 1952 on a study of the chemical characteristics of turkey carcass fat as a function of dietary fat. These workers found that the content of total saturated fatty acids in the depot fat of turkeys was maintained at a fairly constant level of approximately 28 per cent total saturated fatty acids, regardless of the fat content of the diet or the type of fat fed to the turkeys. The depot fat synthesized by the turkeys on a low-fat diet contained approximately 68 per cent oleic acid. When the diet was supplemented with varying levels of linoleic or linolenic acids, the amounts of these acids present in the depot fat varied roughly in proportion to the amount of these acids in the diet,

In two recent reports by Mecchi and associates of the Western Regional Laboratory, in cooperation with Marsden and Lillie of the Beltsville Research Center of the Department of Agriculture (15, 16), results are presented on the fatty acid

TABLE 3 Fatty acid composition of different species of poultry*

SPECIES	LOTS	IODINE NUMBER	SATURATED ACIDS	OLEIC ACID	LINOLEIC ACID	LINOLENIC ACID	ARACHIDONIC ACID
			%	%	%	%	%
Chicken	4	63—80	28—31	47—51	14—18	0.7—1.0	0.3—0.5
Turkey	6	73—79	28—33	39—51	13—21	0.8—1.3	0.2—0.7
Duck	1	87	27	42	24	1.4	0.20
Goose	1	67	30	57	8	0.4	0.05
Pigeon	1	82	23	56	17	0.7	0.04

*Data taken from Mecchi *et al.* (15).

TABLE 4 **Average composition of various food fats***

FOOD FAT	SATURATED FATTY ACIDS	UNSATURATED FATTY ACIDS	ESSENTIAL FATTY ACIDS		
			Linoleic	Linolenic	Arachidonic
	%	%	%	%	%
Butter	57	43	4	0	1
Beef tallow	53	47	2	0.5	0.1
Cottonseed oil	24	76	45	2	0
Turkey fat	30	70	17	1.1	0.4
Chicken fat	30	70	16	0.9	0.4

*Values for turkey and chicken fat from Mecchi *et al.* (15); all others from "Composition and Constants of Fatty Acids" (17).

composition of different species of poultry. These are shown in Table 3.

Data are presented in Table 4 showing that the degree of unsaturation in turkey and chicken fats resembles that of cottonseed oil indicating, therefore, that the fats of turkey and chicken meats must be classified, along with the vegetable fats, as relatively high unsaturated fats.

Summary and Conclusions

The cholesterol of turkey meats relative to other animal foods is presented. Turkey meats are lower in cholestrel than the other foods considered.

An examination of relative iodine numbers and the results of recent studies on the composition of the fats of turkey and chicken meats show that the fats of these species contain a high percentage of unsaturated fatty acids, resembling in this respect the vegetable fats which have been shown in certain experimental conditions to be beneficial in reducing or in maintaining low levels of plasma lipids, especially cholesterol. The importance of this in terms of the etiology of coronary heart disease has been discussed.

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Accidents

Despite our well organized safety campaigns, accidents are still the fourth leading cause of death in this country. The Health Information Foundation reports sharp declines in deaths from industrial accidents, but less improvement with respect to home accidents, which cause about 30,000 accidental deaths each year.

Thiamine and Riboflavin in Roast Lamb[1]

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CLARK AND FINCHER (1) considered available figures for cooked foods too inadequate to justify calculating corrections for cooking losses in the nutritive content of the diets of individual homemakers. Likewise, the Food Distribution Research and Marketing Advisory Committee recommended recently that special emphasis be given to determining the cooking quality and nutritive value of livestock products (2).

The present paper makes a contribution to the latter area. It reports data on the effect of roasting on the thiamine, riboflavin, fat, and moisture contents of lamb. The effects of roasting to different degrees of "doneness," as indicated by interior temperature, of roasting with the bone left in and removed, and of roasting different cuts are also considered. The factors of "doneness" and of the presence or absence of bone were included because each has been shown to affect the length of the cooking period (3-7), which in turn might affect the thiamine content of the cooked meat, since thiamine has been reported to decrease with increase in heating time (8,9).

Experimental Procedure

PREPARATION OF SAMPLES

For the experiments with degree of "doneness," three pairs each of lamb legs and of boned, rolled shoulders were used. The cuts were from choice animals of Hampshire, Southdown, or Shropshire breed, which had been raised on corn, oats, bran, oil meal, alfalfa hay, and silage. Prior to cooking, approximately 200 gm. were cut from each end of each roast. The two portions so obtained from a roast were ground, thoroughly mixed, and used as the raw sample. The remainder of each roast was weighed and placed on a rack in an open pan. One member of each pair was roasted to an interior temperature of 82°C., the other to 79°C., at an oven temperature of 149°C. After cooking, the inedible portion was removed and weighed. The edible portion was also weighed, then finely ground, thoroughly mixed, and used as the cooked sample.

For the experiment with non-boned vs. boned roasts, eight pairs of choice lamb shoulders were used. Four pairs were trimmed into square-cut roasts, the others were boned and rolled. The edible portion of one member of each pair was ground, thoroughly mixed, and used as the raw sample for the pair. The other member was roasted to an interior temperature of 79°C. in an oven at 149°C. After roasting, the edible and inedible portions were separated and weighed. The edible portion was then ground and thoroughly mixed.

For the experiment with different cuts, 11 pairs of shoulders, 3 of legs, 4 of rack roasts, and 3 of loin roasts were used. One member of the pair was taken for the raw sample, the other roasted to an interior temperature of 79°C. in an oven at 149°C. The edible portion of each raw and cooked roast was finely ground and thoroughly mixed.

ANALYTICAL METHODS

Thiamine and riboflavin were determined on 0.1 N sulphuric acid extractions of the raw and cooked ground samples by the methods of Conner and Straub (10) and Peterson, Brady, and Shaw (11), respectively. In each case, internal standards formed the basis of calculation. A recovery sample, to which a known amount of thiamine or riboflavin was added before extraction, was run also with each determination. The mean recovery of thiamine was 96 ± 2.4 per cent and of riboflavin, 97 ± 2.4 per cent.

The percentages of thiamine and riboflavin retained in the cooked meat were calculated on three bases, namely, the vitamin content before and after cooking of (a) the entire roast, (b) a unit weight of dry fat-free solids, and (c) a unit weight

[1]Scientific Journal Series Paper No. 801, Minnesota Agricultural Experiment Station. Received for publication August 1, 1957.

TABLE 1 **Mean thiamine and riboflavin in raw and roasted lamb and retention after roasting**

CUT	MEAN THIAMINE			MEAN RIBOFLAVIN		
	Raw roast	Cooked roast	Retention	Raw roast	Cooked roast	Retention
	*mg./100 gm.**	*mg./100 gm.*†	%‡	*mg./100 gm.**	*mg./100 gm.*†	%‡
Leg	0.176±0.05#	0.194±0.09	64± 8	—	—	—
Shoulder	0.088±0.02	0.078±0.02	63±10	0.164±0.07	0.207±0.07	93±11
Rack	0.110±0.06	0.082±0.04	62± 6	0.205±0.04	0.219±0.04	85± 9
Loin	0.169±0.04	0.138±0.02	66± 5	0.333±0.06	0.242±0.05	88±12

*Raw weight.
†Cooked weight.
‡Calculated on entire roast basis.
#Standard deviation.

of dry solids. The first two of these methods of calculation gave mean retention values which were not significantly different from each other. The standard deviations calculated on the roast basis, however, were only about one-third as large as those calculated on the dry, fat-free solid basis. The third basis of calculation, that is, dry solids, gave retentions significantly higher than the other two, thus indicating that the change in fat content during the roasting of choice lamb cuts is too great to be disregarded when comparisons are being made of raw and cooked samples.

Fat was determined by anhydrous ether extraction of the dried ground meat. Moisture was determined as the loss in weight of 10-gm. samples of the ground meat during heating for 18 hr. at 60°C. in a vacuum of 28 in. mercury.

Results and Discussion

Legs and rolled shoulders of lamb roasted to the well-done stage (interior temperature of 82°C.) were not significantly different in percentage retentions of thiamine, fat, and moisture from corresponding paired cuts roasted to a medium well-done stage (79°C.). The latter were not significantly different in riboflavin retention[2]. Likewise, rolled shoulders were not significantly different in any of these factors from square-cut ones when both were roasted to the medium well-done stage (79°C.). Thus, the slightly longer heating required for the well-done stage and for the boned roasts was not sufficient to cause further destruction of even heat-sensitive thiamine. These results should not be considered contradictory, however, to those of Rice and Beuk (8) and of Feliciotti and Esselen (9) since the conditions of heating were much milder than they used.

Since the percentage retentions were not significantly different, they were averaged for each cut and will be discussed below.

The mean thiamine, riboflavin, fat, and moisture contents of the several cuts of lamb included in the study are given in Tables 1 and 2.

The average thiamine value for the raw meat from the leg cut was within the range of values reported in the literature (12-16), that for the roasted leg was slightly higher than any reported (12,13,15), and those for shoulder and rack, both raw and cooked, were slightly lower than any reported (12, 13, 16)

The riboflavin averages for raw and cooked shoulder and for cooked rack were slightly lower than values reported (12, 16, 17), while the average for raw rack was slightly higher (12). The average fat content was somewhat higher and the moisture content somewhat lower for both the raw and cooked samples of all of the cuts (12,15,16).

The average percentages of thiamine and riboflavin retained in the edible portions of the various cuts after roasting are also included in Table 1. Neither the thiamine nor riboflavin retentions for the different cuts were significantly different from one another. The retention of thiamine in lamb roasts may be considered, therefore, to be a little less than two-thirds and that of riboflavin approxi-

[2]Riboflavin values were not obtained for the legs of lamb.

TABLE 2 **Fat and moisture content of raw and roasted lamb**

CUT	MEAN FAT		MEAN MOISTURE	
	Raw	Cooked	Raw	Cooked
	%	%	%	%
Leg	25±3.9*	18±4.1	56±2.7	57±1.6
Shoulder	30±6.0	32±7.5	54±5.0	48±4.6
Rack	43±5.6	42±3.2	46±5.1	38±5.5
Loin	37±4.9	39±3.4	51±4.5	43±1.9

*Standard deviation.

mately seven-eighths of the amount present in the raw edible portion.

The quantities of thiamine and riboflavin dissolved in the drippings were about the same for the different cuts and amounted to approximately 5 per cent of the quantity of thiamine or riboflavin present in the raw edible portion.

Calculations based on the figures just presented show that a 4-oz. serving of the various roasts would furnish the following percentages of the thiamine and riboflavin dietary allowances recommended by the Food and Nutrition Board of the National Research Council for a twenty-five-year-old, 143-lb. man: leg, a little less than 10 per cent of the thiamine allowance; shoulder or rack, a little less than 5 per cent of the thiamine and 15 per cent of the riboflavin allowance; and loin, about 10 per cent of the thiamine and 20 per cent of the riboflavin allowance.

Summary

The effect of roasting on the thiamine, riboflavin, fat, and moisture contents of lamb have been determined and the percentages of thiamine and riboflavin retained in the cooked meat have been calculated. Leg and shoulder pairs were roasted to interior temperatures of 82 or 79°C., and rolled and square-cut shoulder pairs were roasted to 79°C., to learn if the longer heating period required by the first treatment in each group would affect thiamine retention. Rack and loin roasts, likewise, were heated to 79°C. An oven temperature of 149°C. was used for all of the roasting.

The longer heating periods did not affect the amount of thiamine retained in the cooked meat.

Retail cuts from the various sections of the animal usually recommended for roasting were not significantly different in the percentages of thiamine and riboflavin retained in the roasted edible portion. The average amount of thiamine retained was 64 and of riboflavin 89 per cent of the quantity present in the raw samples.

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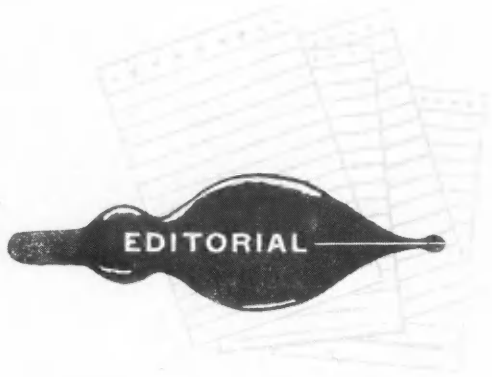
Burning Dietetic Problems in the Thirteenth Century

Petrus Hispanus (born about 1210) in his *Universal Diets and Particular Diets* posed a number of questions about food and diet, which are presented again in the twentieth century in History of Magic and Experimental Science, Volume II, by Lynn Thorndike (New York: Columbia Univ. Press, 1923). Some of these are:

What should be the diet of those taking mental exercise like students?

Why in some foods is the liquid substance of the same nature as the solid and in others not?

Should wine be drunk before and after eating, and immediately following or long afterward?—*Contributed by Clive M. McCay, Ph.D., Professor of Nutrition, New York State College of Agriculture, Cornell University, Ithaca.*



Policies for Effective Administration of the Department of Dietetics[1]

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PERHAPS ONE way to achieve some measure of success in relation to total patient care in the hospital is to consider establishing policies within the hospital which would insure that all factors relating to food service be considered. In preparing this article, the authors had in mind certain points which they felt were purposeful: First, there must be certain established concepts for the development of effective administration of the department of dietetics. Second, such concepts would be useful to the hospital administrator in crystallizing a pattern for evaluating situations as they may exist in a department of dietetics. Problems common to the hospital administrator and the director of dietetics could be resolved by use of these tools that would permit them to approach a dietetic situation in a similar and consistent manner.

These tools could be used in several ways:

(a) As a guide in the pattern of thinking, in developing better communications, and in establishing policies by an administrator in a new appointment.

(b) As a guide for the chief administrative dietitian or director of dietetics in making a periodic evaluation of her department or as a guide in serving the department following a new appointment.

(c) As an educational instrument for teaching dietetic interns.

(d) As an aid in the general orientation of medical interns and residents and for administrative residents.

[1]This material is also included in the February 1, 1958 issue of *Hospitals*, Journal of the American Hospital Association.

The policies suggested below are not intended to be a sure-cure panacea for the food service ills of the hospital. There is always the human element to consider and the willingness of all concerned to take what could be considered a desirable and logical approach in dietary organizational planning. It would seem, however, that a governing board, a medical staff, or a hospital administrator could rightfully expect results in food service to be consistent with their wishes and opinions if these opinions have been brought into discussion from the board level down, as a recorded reflection of the hospital's philosophy in terms of patient care. Only when this has been done will the hospital be rendering the service it should in respect to its proper role as an efficient and well organized unit for patient care.

The types of policies which could well be used for the purpose are as follows:

(1) *A statement, or at least an expression of philosophy, should be submitted by the hospital administrator to the board of trustees for approval defining the standard of patient care, based on recommendations determined through medical-administrative conference and applicable throughout all hospital departments.* The standard of patient care should be clearly outlined to each department head by the administration so that service and treatment rendered to the patient will be uniform throughout the hospital. It must be recognized by the board of trustees that policy providing for the optimum care requires adequate equipment, satisfactory layout, a steady flow of supplies, and a staff of competent personnel.

(2) *There should be a dietetic committee of the medical staff with the administrator and director of the department of dietetics as ex-officio members.* The committee would advise the administrator and the director of dietetics on:

- (a) Teaching, educational, and research activities, both intra- and inter-departmental. In this respect, the committee would, of course, be kept fully cognizant of the limitations imposed by the hospital budget.
- (b) Nutritional standards to be met by the patient food service.
- (c) The preparation and use of a manual of therapeutic diets.
- (d) Operational policies of the department as they affect dietetic service to the patient in terms of quality of meals, type of service, menus, and special catering.

(3) The approved organization of the hospital with the department of dietetics clearly charted should be distributed. The organization chart should indicate clearly the responsibilities and authority of all professional dietetic personnel. It should also indicate the approved divisions

of the dietetic function, e.g., administration, food production, diet therapy, out-patient instruction, educational activities, personnel feeding (cafeteria). One of the most important aspects of a good organizational chart is how clearly it reflects the relationship of the department of dietetics to the other departments of the hospital. A good example of one inter-relationship is that existing between the purchasing department and the department of dietetics in respect to food buying.

(4) There should be an established procedure for preparing the budget. The dietetic budget should be prepared jointly by the administrator and the dietitian based on the hospital policies. The administration should brief each department head on budget preparation. There should be ample explanation regarding compilation of data on income and expense necessary for the preparation of the budget. The department heads should have outlined for them the pattern of operation to be followed in the coming fiscal year based on the general treatment policy established by the governing board, within the limitations of the anticipated financial resources of the hospital.

(5) Conferences should be held at regular intervals to discuss inter-departmental relationships and improvement of patient care. It is important that the organization facilitate communications in the inter-relationships of departments as well as with the administrator. Heads of all hospital departments should be oriented in the particular philosophy of the hospital from which stems policy of the governing board. Department heads should be briefed in the principles of management engineering and the techniques that can be applied in the hospital for improved patient care and should be encouraged to participate in studies to improve their own departmental situation.

(6) There should be written personnel policies for the hospital with special points of reference for the department of dietetics. In addition to the general personnel policies, there should be provided to the department of dietetics authorization for the employment of the required number of professional and non-professional (including clerical) persons; and the salary scales commensurate with these positions. The department of dietetics and the personnel department of the hospital should cooperate in the preparation of job specifications for the various positions allowed and in the recruitment of competent persons for these positions.

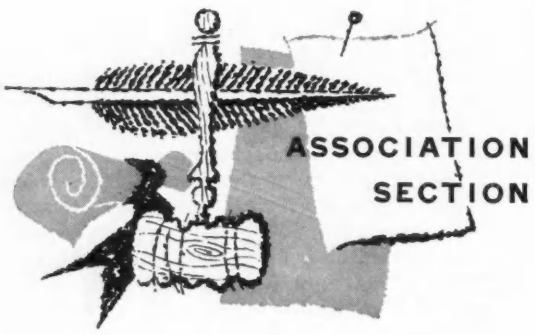
National Food Outlook for 1958

In its annual Outlook Issue, *The National Food Situation* (published quarterly by the U.S.D.A.) predicts that civilian consumption of food through 1958 will be close to the 1957 per capita rate. Retail food prices until at least mid-1958 may be a little higher, reflecting strong consumer demand, slightly lower food supplies, and somewhat higher average marketing margins for food.

Food supplies in the next several months are expected to remain adequate to maintain consumption by civilians at about the level of late 1956 and early 1957. Among the livestock products, supplies of meat and eggs through this spring will be down some from 1957, but there will be about as much turkey meat and lard, and more dairy products and chicken. Among foods coming from crops, supply prospects point to more fresh deciduous this winter and spring than last, and about as much processed fruits and vegetables, sweet potatoes, and vegetable oils. About as large a total tonnage of fresh vegetables will be available in the several months ahead, but less potatoes, dry edible beans, and dry field peas.

Large stocks of food and feed are being carried over into 1958. If weather is at least average, large food crops can be expected this year. Production of livestock products will be maintained at a high rate. The levels of prices last fall may encourage farmers to raise more hogs than in 1957, with most of the increase marketed after mid-1958. Milk production will likely be up some because of the continued increase in output per cow.

No important shifts from the 1957 level or pattern of food consumption are anticipated for 1958. Civilians are expected to have a little more per person of pork and chicken meat. Small reductions from 1957 are in prospect for beef and veal. These declines will bring the meat consumption rate slightly below that of 1957, but it probably will be higher than in most of the forty-five years before 1955. Compared with 1957, some reduction in the consumption rate this year is also likely for eggs and canned fish. For the other major food groups, civilian consumption in 1958 is expected to be about the same as the rate for 1957.



Continuing Education—1957-58

The Executive Board of The American Dietetic Association in January 1957 announced a newly created staff position, that of Continuing Education Services Director. Mrs. Bessie Brooks West assumed this responsibility for a one-year period during her leave of absence from Kansas State College.

The committee appointed to study the needs for such a service outlined the objectives of this new position as follows:

(a) To develop additional services for members and to implement further the objectives of the Association, specifically by giving help by such means as workshops, group conferences, and institutes.

(b) To expand and coordinate the educational functions of the Headquarters office as they relate to the internships, the colleges and universities, and the individual members.

(c) To publicize and utilize the information obtained from section and committee studies and reports for the improvement of the services of the members.

(d) To stimulate and promote continuing education of all members and graduate study among qualified members.

(e) To develop the talents and resources of the members through helping them to expand educational skills.

(f) To serve as consultant in the preparation of educational material.

(g) To assist in a continuous evaluation of the educational program of the Association.

Little data concerning the status of continuing education programs in state and local associations were available at that time, and the first step taken by the Director toward developing a program was to determine: (a) what had been done in this area, (b) what was being done, and (c) what each member believed to be needed for her own future professional growth.

To learn what had been and what was being done, a brief check list was sent to all state and local dietetic association presidents and education section chairmen. One or more replies were received from each group. These indicated that continuing education programs have been and at present are varying from none at all to highly developed programs in some state and local associations. In order to make contacts with each member, a check list designed to obtain general information concerning membership interest in a continuing education program was mailed during the summer. A total of 625, or 5 per cent, of the forms were returned with approximately 1500 requests and comments.

The answers indicated that assistance in administration, in diet therapy, and in teaching methods and techniques was desired as follows:

AREAS IN WHICH ASSISTANCE WAS DESIRED	NUMBER OF REPLIES
Administration	303
Diet therapy	282
Teaching	261
Nutrition	135
Research	123
Communications	91
Feeding of specific groups	78
Education	62
School lunch	44
Other	64
Total	1,443

These figures compare proportionately with the occupational distribution of our members and their indicated areas of employment.

Replies received were from members with varying years of experience, as shown below:

YEARS OF EXPERIENCE	PER CENT
1 to 5	21
6 to 10	24
11 to 20	29
21 to 30	21
30 plus	5

This first check list to the members served primarily as a point of contact between the individual members and the officers and staff of the Association. If these returns in any way represent a cross section of the membership needs, officers and staff of our Association have been provided with considerable food for thought. However, the results from such general questions and so few returns do not adequately provide the basis for an active program.

With a view to planning a program by the Continuing Education Services Director based on the need of the members, it is suggested that each member think in terms of:

(a) What do I want?

(b) What materials and other resources do I have available that I can use in promoting my own growth?

(c) What do I not have?

(d) What do I need to supplement materials available?

In other words, each member—as well as each

state and local association—can best begin a program of continuing professional growth by analyzing needs, determining what is at hand to assist her, and where to look for help within her reach.

Conferences and Workshops

Large numbers of members have expressed an interest in conferences and workshops, and the planning for this type of meeting in as many state and local communities as possible seems to be strongly indicated. It will be necessary, of course, for the Continuing Education Services Director to limit the number of such meetings in which she participates each year. However, with her help and that of the resource persons within the community, such as college faculty and members of the Association with specialized talents, the planning and carrying through of conferences of great benefit to the participating members should become a reality.

Journal

A large number of responses also indicated that articles in the JOURNAL relating to the above interests would be helpful. Here again, is the place where each member can:

(a) Analyze his own specific problems.

(b) Search the JOURNAL carefully for articles and abstracts dealing with these problems.

(c) Review and restate the problems, in the light of this information. If they remain unanswered, seek out proper sources and well qualified individuals who can offer a professional approach. The newer findings of research studies may prove applicable to your own situation.

(d) If the answer is new, sound, and of wide interest, members are urged to invite a prospective author to submit a paper to the JOURNAL. The editors and the Journal Board will welcome the opportunity to read papers submitted for publication.

If the JOURNAL is to be of value to you, the members, it must have the cordial support of each and every member. True success depends on enthusiastic support from all.

Annual Meeting

It was likewise noted that additional specific information in certain areas is desired through our Annual Meeting.

The principles mentioned concerning the JOURNAL also apply to the program of the Annual Meeting, for example:

(a) In reviewing the over-all subject content of recent Annual Meeting programs, has the member felt his needs were or are being met? In connection with this, did he participate in completing the Evaluation Form distributed during the Meeting? The Evaluation and Program Planning Committees have found such comments most valuable and many of them serve as guides in future planning.

(b) Has the member given suggestions for possible authoritative speakers and specific subject content for the programs of the Annual Meetings? Such suggestions will be welcomed by the Planning Committee and may prove helpful in formulating the program.

The Annual Meeting is designed to meet the needs of the members, bringing up-to-date information with a look to the future, through: formal presentations, discussions, and conferences. Much is gained by the individual from the inspiration and stimulation received as a result of participating in the over-all program, including the sessions, exhibits, and social events.

Mixes Compared with Scaled-Formula Counterparts

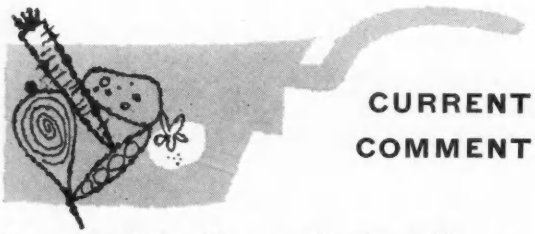
At Florida State University, a comparative evaluation of sweet dough dry mixes and their bakery formulated counterparts has been made under conditions which might exist in a small or medium-size bakery. The results in almost all categories of comparison were favorable to the products made from mixes.

Three different sweet-dough mixes were used to make miniature loaves; 8 in., 8-oz. round coffee cakes; raised doughnuts; and cinnamon rolls.

In terms of losses and yields, measurable economies were achieved from the use of dry mixes in place of scaled formulas. Time studies indicated considerable savings in skilled labor and over-all savings in fixed costs apportioned to each phase of production. Easier accounting controls with dry mixes resulted in lower accounting costs and smaller inventories. Other advantages reported were: increased uniformity of products, improved keeping quality, shorter processing periods that facilitated tight production schedules, and simplified maintenance of proper sanitation.

Comparison taste testing of the products was done by three panels composed of: consumers, students, and personnel on the project. These evaluations indicated that, in general, the quality of the dry-mix products was superior as to taste, flavor, eye appeal, and internal and external characteristics.

The study was sponsored by Pillsbury Mills, Inc., Minneapolis.



CURRENT COMMENT

Teaching Nutrition to Student Nurses

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NUTRITION expressed as concern with food for the feeding of patients has been a part of nurses' training since its earliest days. At the time of the Crimean War, Florence Nightingale was cognizant of the need for food which satisfied her patients and of the role that food played in helping to speed recovery. She recommended that training programs for nurses should include the preparation and serving of food. However, few hours were devoted to the teaching of "invalid cookery," as it was then described.

One of the first training programs in the United States which included food instruction was offered at the Woman's Hospital of Philadelphia in 1863. The entire program was only six weeks in length and among the lectures listed was dietary instruction in methods of cookery. Packard (1), describing training schools in the United States in 1876, felt that the preparation of food and the administration of food services should be included in the nurses' training program, because a thorough practical understanding of these details was an indispensable aid to the nurse. However, there are few recommendations as to the numbers of hours of suggested instruction or the placement of this subject in the curriculum.

Nursing Education after 1900

By the early 1900's most training programs allotted some time for the study of foods within the first six months of the three-year curriculum. Usually the study included 12 to 15 hr. of lectures covering foods which could be used in feeding the sick and the basic principles of food preparation. The student nurses were given experience in setting up trays and generally helping in feeding patients, but there was no time set aside for experience in the diet kitchen. The first planned diet kitchen experience was reported by Fewell (2) in 1916. Nursing educators and dietitians at that time agreed that basic principles of cooking and experience in the preparation of food should be given. As Fewell said (2), the objective was to "give the nurse thorough training in invalid cooking and sufficient knowledge to pass state boards." To achieve this objective, an adequate period of time for instruction was felt to be ten weeks of 8-hr. days. However, other schools favored diet kitchen experience of six to eight weeks. There was considerable discussion concerning the preparation required of the nurse before coming to the diet kitchen. Some argued that since the dietitian would be occupied with other duties, she would not have time to teach the student while she was in the diet kitchen, and also that there should be some previous classroom and laboratory instruction in order for the nurse to understand basic principles of cooking before attempting to cook on a large scale. Furthermore, it was felt that the student should have had some contact with patients before going to the diet kitchen, as she would have a better understanding of the role of diet in the recovery of her patients.

This paper gives an excellent over-all view of a nutrition program in nursing which does not cut corners. Moreover, every aspect of nutrition that is taught is related to health teaching and patient care. This is a fine example of the integration of nutrition into the total nursing curriculum.—Henderika J. Rynbergen, Associate Professor of Science, Cornell University—New York Hospital School of Nursing, New York City.

The development of service in the diet kitchen as a planned experience during the first year of the nurse's training program covered many years. The preliminary lectures in nutrition were few, and perhaps one or two hours were set aside to cover all therapeutic diets. In 1925, Smith suggested (3) that less time be spent in the actual preparation of food and more time in writing and analyzing diets so that the nurse would be able to adapt the usual diet of the individual to meet the requirements of the therapeutic diet prescribed. The use of the case-study method to correlate the clinical findings and the effect of the diet was stressed.

From 1920, as the science of nutrition developed, emphasis went from complete food preparation and invalid cookery to the teaching of principles of nutrition and diet therapy. This included the more practical aspects of food preparation and of feeding the patient. More recently, emphasis has been placed on the psychologic, social, and cultural aspects of food for the patient. Such trends lead toward the

[1]The writer wishes to express her appreciation and gratitude to Dr. Elizabeth L. Kemble, Dean, University of North Carolina School of Nursing, and to members of the faculty without whose keen interest and cooperation this program would not have been possible; and to Dr. Charlotte M. Young, Graduate School of Nutrition, Cornell University, for her helpful suggestions and comments regarding this article.

methods encountered today in teaching student nurses.

Modern Trends

During the middle thirties the length of experience in the diet kitchen was decreased to four weeks, and the use of an accompanying food laboratory had been accepted. Case studies and case conferences were also being used to a greater extent. These methods made nutrition more meaningful to the student. The next step forward was to integrate diet therapy lectures and experience with medical lectures. Bryan suggested (4) that if such a plan were followed, the role of diet in the care of the patient would appear in proper relation to the rest of his treatment. At the present time, in some schools (5) the diet kitchen experience is being eliminated, since the trend is to reduce the number of modified diets in therapy and to do away with diet kitchens as such. The present trend in diet therapy is to modify the patient's normal diet after talking with the patient and doctor and determining the individual's needs.

We have just noted some of the steps whereby nutrition and diet therapy have been taught in schools of nursing leading to currently more acceptable methods. Unfortunately in the past, some of the experiences employed in teaching left the student nurse with an unfavorable attitude toward any phase of nutrition. One reason for this was the isolation of nutritional instruction from all other aspects of nursing and the lack of integration of feeding experiences with other aspects of patient care. To counteract these deficiencies, many schools of nursing have developed a program whereby nutrition and diet therapy and the diet kitchen experience are integrated throughout the entire nursing program. Such integration is effective in aiding the student nurse to see the practical applications of nutrition in relation to the total care of the patient. Hence it leads to a more favorable attitude on the part of the nurse toward food and nutrition. The nurse can see that the total nursing care of the patient includes nutrition in many ways, whether it be normal or therapeutic. Nutrition is one aspect in the treatment of illness. Since the nurse is with the patient for long periods of time, she has a great opportunity for health teaching which should include nutrition.

Program at University of North Carolina

The nutrition program for the University of North Carolina School of Nursing may be taken as representative of the modern integrative approach. It has been planned in such a way as to incorporate some phase of nutrition in every year of the four-year program and to teach various aspects of food and nutrition at appropriate times so that the dietary care is seen as an integral part of the total care of the patient. Diet therapy and clinical experiences are incorporated, providing an educational experience more significant than just so many hours of work in a diet kitchen. In the planning and development of the nutrition program, the guiding principles were evolved from the statement of philosophy of the School of Nursing developed by the faculty. Recognizing nursing as a social institution and a vital force in society, the School of Nursing provides a specialized environment which is dedicated to the task of preparing young people in the development of nursing competence so that they may meet the demands of health, illness, and social needs of society. This development is based on the fundamental principle of the democratic ideal which says, "Whatsoever ye would that men should do to you, do ye even so to them."

The guiding principles were: to develop an appreciation of the relationship of good nutrition to health and to the treatment of illness; to develop the student nurse's ability to apply the fundamentals of nutrition and therapeutic diets with due regard for social, religious, and economic factors in the lives of patients; to develop an understanding of the behavior of the patient and to consider him as a human being; and finally, to present the nutrition program in such a way that the teaching of nutrition will be enjoyed by the student nurse and will be applicable to the patient.

Described in subsequent paragraphs is the food and nutrition program as experienced by our students during each year of training.

First Year

In the first semester of the program the nutritionist gives a 1-hr. lecture half-way through the course. This is part of a course in basic nursing which discusses the basic needs of the individual. At this time the student nurse meets nutrition on a personal basis. The nutritionist discusses the basic nutritional needs of an individual, in this instance, the student nurse, and the student and the nutritionist become acquainted. Conferences are arranged with students on an individual basis to discuss nutrional problems throughout the semester.

Students come from many backgrounds, bringing many unusual ideas regarding food as well as firmly developed food habits. For some, this is their first experience in living away from home, and their eating patterns may fluctuate a great deal in the process of adaption to a new environment. Nutrition instruction at this stage is oriented to the nurse's own well-being. The Basic 7 food groups are used as a basis for aiding her in the selection of her diet and in the budgeting of her money for food.

The following semester, the nutritionist attends the class in nursing arts. Here, during a 1-hr. lecture, she gives a brief description of the dietary department, diets encountered in the hospital, and

some of the attitudes patients may have toward food. The nursing instructor then gives a demonstration on how to feed a patient. Such an integration of instruction makes the students aware of the role of food in relation to the work they will be doing and introduces the dietitian as a part of the team giving total nursing care to the patient.

Second Year

The second year of the program presents the courses in foods and nutrition, and diet therapy. A 60-hr. course in foods and nutrition is given in the fall semester, followed by a 45-hr. course in diet therapy in the spring. The clinical experience in diet therapy also begins in the spring semester.

FOODS AND NUTRITION COURSE

A chemistry course precedes the 60-hr. course in foods and nutrition which consists of thirty lectures and fifteen 2-hr. laboratories. This is geared to the practical application of nutrition to everyday life. The anatomy and physiology of the digestive tract are taught in a separate course by doctors of the School of Medicine in the freshman year. The food laboratories are arranged so that the student learns the fundamental principles of planning, preparing, and serving simple meals which would meet a family's needs. Outlined below is a summary of the classes and hours spent in this activity.

Basic principles of cookery	14 hr.
Starch-thickened products (including white sauces, cream soups, and cornstarch puddings.)	
Eggs	
Vegetables	
Meats	
Pastry, cakes, biscuits muffins, and so on	
Menu planning	4 hr.
Preparation and serving of simple meals	8 hr.
Breakfast	
Lunch	
Dinner	
Low-cost meals	
Student-selected laboratory projects (foreign foods, preparing candy, fancy desserts, and so on)	4 hr.

Some teaching dietitians feel that food laboratories are no longer necessary unless a student has had no cooking experience. However, if there are good laboratory facilities, the experience is valuable. The course must be family-centered if students are to apply what they learn in laboratory sessions. To make teaching effective, one must consider the preferences of the students and their families. Planning of sound menus can be boring if the menus are not used. Perhaps menus could be planned for the student's family which would help to improve her family's nutritional status as well as the student's own. Many nurses marry and hence need to know how to feed not only themselves and their patients, but also their future families. Since the nurse working in the hospital and especially the nurse in public health must in many instances be responsible for nutritional instruction of patients, it would seem advisable for the nurse to know how to cook. Low-cost meal plans and budgets are emphasized, and students have the opportunity to plan and prepare low-cost meals. Several laboratory periods are set aside so that the student may prepare what she pleases.

One phase of the course which students enjoy is taking a dietary history. At the end of the course in foods and nutrition, each student takes a dietary history of a patient for whom she has cared as part of her beginning nursing experience. The students feel that this assignment puts their nutrition knowledge to use and benefits their patients as well. The dietary history plays an important role in the development of the nutrition instruction of the patient, as the student needs to know the food habits and idiosyncrasies of her patient before beginning dietary instruction. The patient is asked about his general meal pattern and a weekly food summary is used as a cross-check on the food intake. The food summary is then compared with the Basic 7 for estimation of nutritional adequacy, and thus guides the nurse in her instruction of the patient. Other information elicited from the patient includes: occupation, place of meals, time for eating, home-produced foods, and who prepares the food at home. These are all factors which may influence what the patient eats. The patient is asked about hidden sources of calories which may influence the weight, such as type and frequency of snacks, i.e. candy, cocktails, and desserts. The taking of a dietary history gives the student practice in interpreting normal nutrition to the patient as well as improving her interviewing techniques.

DIET THERAPY COURSE

The 45-hr. course in diet therapy is given in the spring semester and parallels in order of subject matter the presentations in the classes in medical and surgical nursing. This enables the student to visualize diet as a part of the entire treatment of a given disease rather than as unrelated therapy. The best illustrative materials to use are case histories of the patient and his family.

Instead of having the more conventional plan of four to six weeks of assigned dietary experience, the diet therapy experience of four weeks is integrated with the clinical experience. This experience is not part of the 45-hr. course, but is given as additional clinical experience in the areas of medicine, surgery, obstetrics, and pediatrics. Medical-surgical nursing is taught in the second year of the program. Obstetric and pediatric nursing are presented in the third year when nursing experience in these areas is scheduled. By adding one week more to the

time scheduled in the clinical areas mentioned above, 1 to 2 hr. of supervised dietary experience is provided during each week while a student is in these areas.

Students are assigned to medical and surgical floors at the beginning of the spring semester of their second year and during the summer. Each student has the same group of patients for a period of one or two weeks, and the number of patients assigned to each student at one time varies according to her capabilities and to the amount of nursing care the patient needs. On the average, a student is able to assume responsibility for the total nursing care of four patients. She is responsible only for these four patients. This allows her time to study the history, progress records, laboratory reports, and similar materials in order to know and understand her patients' condition thoroughly.

Conference time for diet therapy experience is arranged weekly for 1 to 2 hr. by the clinical instructor and nutritionist, and includes eight to ten students from the same ward. At this time, each student selects one of her patients and presents the factors in the patient's background which may have a bearing on his present illness and his course of recovery. Such information should include the patient's occupation, economic and social background, his disease, medications and treatments, and significant laboratory findings and how they are related to his nutritional needs.

During this time, the students write diets for patients, take dietary histories, and give dietary instructions under the supervision of the nutritionist. Dietary rounds may be made to patients with interesting dietary problems and/or disease conditions in which diet plays a role.

One morning of the spring semester is spent visiting the hospital dietary department, so that the student nurse may have a better understanding of the functions and problems in operating such a department. The student nurse also learns in what way she is a vital link between the dietitian and the patient and can assist the dietitian in a better understanding of her patient's food attitudes and needs.

Since diet therapy is being taught at the same time, there is an excellent opportunity to correlate actual experience with classroom teaching. It may be slightly difficult at first, if students should be assigned patients on modified diets which have not been discussed in class. Later, however, when the diet is studied, the student has first-hand information. Normal diets are also discussed, and the student has an excellent opportunity to apply the knowledge learned from the nutrition course to the patient. Teaching patients on regular diets good nutrition is as much a challenge and a necessity as teaching therapeutic diets. That students are really interested in nutrition has been shown by more accurate description in the nurses' notes on the charts, by their writing better diet sections in their nursing-care studies, and by the progress they have made in discussing nutrition with their patients.

The importance of discussion of these nutritional problems cannot be overemphasized. When the patient leaves the hospital, he feels that he has received good nursing care, he understands his diet, and he will cooperate with the treatment prescribed. He leaves with enough practical knowledge to continue his diet at home.

HOME VISITS AND OUT-PATIENT WORK

During the second year another opportunity for the student nurse to see the importance of nutrition and its relation to nursing occurs when she makes home visits with the public health nurse. Nutritional teaching is mentioned in many of the reports written by the students. It is through these visits that the interest in nutrition is stimulated and the student develops an awareness of the importance of nutrition.

The Out-Patient Department plays an important role in the development of the student's learning experience in nutrition. While the students are assigned to medicine and surgery during their sophomore year, they spend two weeks in the Out-Patient Department. Here they have an opportunity to observe the ambulatory patients and the problems presented from the nutritional standpoint. They may even have cared for some of these patients while they were in the hospital. A conference is held once a week to discuss the nutritional needs of these patients and ways in which the nurse may help. Some are referred to the Home Health Service and a public health nurse then visits the home. In some instances, the student may see the results (good or bad) of her nutrition instructions as the patients return to the Out-Patient Department.

Third Year

Pediatrics, obstetrics, and tuberculosis are the clinical areas to which the students are assigned during the junior year. One to 2 hr. per week are allowed for the diet therapy experience, the same amount of time as planned in medicine and surgery during the second year. The students spend nine weeks in the pediatric wards, four weeks in the Pediatric Clinic of the Out-Patient Department, four weeks in the Pre-Natal Clinic of the Out-Patient Department, nine weeks on the obstetrical floors, and six weeks in tuberculosis.

The normal diet during pregnancy and lactation, formula preparation, and the diet in complications of pregnancy are presented when the classes in obstetrics are taught. Lectures are placed at appropriate intervals during the course to correlate nutrition with the obstetrical information being given. In

the hospital, as part of the diet therapy experience, students assist mothers in feeding their babies, give formula demonstrations, and help the mothers with dietary problems, whether their own or their babies'. In the Pre-Natal Clinic of the Out-Patient Department, the student has an opportunity to discuss the mothers' diets and take dietary histories. She also emphasizes the doctors' instructions regarding diet for the mothers and gives instructions in the normal diet when necessary. Since the student has a chance to observe the mothers' class in nutrition, she may have an opportunity to see her patient later when she is assigned to the obstetrical floor.

The pediatric lectures on infant, pre-school, and school-age nutrition are also correlated with classwork. During this service the student spends four weeks in nursery school, where she has an opportunity to see how healthy children eat and where she observes their reactions to food. (Later she is able to compare the difference when feeding sick children.) The students eat meals with the children, and conferences are planned to discuss their attitudes and eating habits. This can lead to further discussion with the parents regarding their children's eating problems.

In the Well Baby Clinic, the student may see a former patient or a child from the nursery school come in for a check-up. The student talks with the mother about the child's diet and emphasizes any dietary instructions the pediatrician may give to the mother. In many instances, the students make suggestions on the preparation and serving of food for children and assist in formulating good eating habits.

The same type of program described for medicine and surgery is followed when the student is assigned to the pediatric floor. In some instances, she may be assigned a patient whom she has seen while in the Pediatric Clinic.

During the tuberculosis program, a 1-hr. lecture on nutrition for the patient is given and 3 to 4 hr. are spent discussing his nutritional needs. Frequently students help patients with dietary problems to correct them while in the hospital and to develop new food patterns for convalescence.

Fourth Year

The senior year offers a variety of experiences, including a rural hospital, a health department, the psychiatric unit, and the Out-Patient Department.

The rural hospital is in a community of 5000 people located in the center of a farming area of North Carolina. It is a 100-bed hospital serving two counties. Here, the students apply principles and skills of nutrition in a small hospital setting where the working environment is different from that of a large teaching medical center. They also develop an understanding of how rural communities plan and coordinate efforts to meet their health needs and the role of the rural hospital in the community. Students observe the home demonstration agent in action, spend one day in a general practitioner's office, and participate in other community activities during this four-week period. A nutrition conference is planned once during the experience, at which time students discuss new attitudes and food habits learned in this region as compared with other areas of the state. Pertinent nutrition problems relating to patient care and needs are presented by the students. They also note that therapeutic diets may vary from hospital to hospital, but the basic principles of nutrition and diet therapy remain the same.

The public health agency is a city-county health department and offers a well rounded program based on community needs and resources. The health department is near enough to permit close contact with the instructors in the School of Nursing, and one faculty member is assigned full time to the agency area. A full-time public health nutritionist is the staff member who assists and advises the students with nutritional problems. The writer makes two visits to the agency during the students' experience to discuss situations which the students have encountered.

Here is an excellent opportunity for the students to use previously acquired materials and skills in health teaching when making home visits. They observe community nutrition groups, such as Red Cross nutrition courses and weight reduction and Civil Defense groups. The importance of maternal and child health is one aspect in which the students participate a great deal. At the end of their experience, an evaluation conference is held to determine their reactions. Their reports indicate that they see a great need for nutrition and are surprised at the number of questions asked by their patients regarding every phase of nutrition. Many questions are asked of the nurse as she is considered in the public eye an authority regarding health measures.

Senior-year comprehensive nursing brings together the basic principles learned in the care of the patient and furthers the knowledge of the management of the nursing team and unit in the hospital. Much of the instruction is self-directed, and the students arrange with the instructors which patients are to be discussed in conference and the content to be covered. This experience presents an opportunity to review knowledge of nutrition and diet therapy and to apply it.

In psychiatry, a 1-hr. lecture in nutrition for the mentally ill patient is given, and conference time is arranged to discuss nutritional problems.

During the period spent in the Out-Patient Department, the student assumes responsibilities comparable to those of a full-time staff nurse. She also has group nutrition conferences with the pre-natal

patients on nutrition. Since group dynamics, interviewing, and interpersonal relationship are stressed, the student can utilize this opportunity to assist patients with any peripheral problems they may have, as well as those directly concerned with nutrition.

Another aspect of the Out-Patient Department experience in the senior year is the development and planning of visual health education. Nutrition has played a prominent role in this program. Student nurses have planned a series of bulletin boards for the Employee's Health Service, using the theme of climbing a nutrition ladder by starting off with a good breakfast, followed by a display on a nutritional "lunch box" (many employees bring their lunches to work), and finally showing a good meal pattern for supper. The last exhibit of the series presented plans for a vegetable garden. In the report written by the senior students of the class of 1956, they commented on this project as follows:

> It is felt that these visual education displays have been very valuable to all concerned not only for meeting the needs of clinic patients, but also as a worthwhile educational experience for the student nurses. We have become more conscious of the usefulness of visual education boards in clinics, health departments, doctors' offices, hospitals, and in all phases of nursing, and the need for simplicity in setting up such a display.

Evaluation and Summary

To evaluate the effectiveness of such a program as described is difficult, but with the aid of clinical conferences, case histories, reports, and written tests, the nutritionist is able to determine that the students have the knowledge necessary to give instruction in normal nutrition and to assist patients with therapeutic diets. The best evaluation has come from the students themselves, who have said they have felt confident when discussing nutrition with their patients. Although the program is still in a state of flux, this method of integration of aspects of nutrition, diet therapy, and clinical experience has already proved valuable for the student nurse.

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Teaching Nutrition in the Basic Nursing Curriculum

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With the ever-increasing knowledge of the role of food nutrients in the prevention of disease, the nurse must assume increasing responsibility for the therapeutic agent, food, just as she does for drugs and treatments. One of the objectives of Saint Marys School of Nursing is to help our nursing students appreciate diet as a part of the treatment necessary if the patient is to be *completely* cared for. After critical analysis of the curriculum, it was felt that more learning experiences might be planned to include total nursing situations. A change in the dietary experience might help the nursing students to discover the logical relationship between her various areas of knowledge. Therefore, the faculty joined in developing an integrated method of teaching nutrition and diet therapy based on suggestions from the dietary department.

Preliminary Decisions

Many problems had to be solved before the new plan could be introduced. Finding sufficient number of qualified personnel to carry out the program was difficult in the years following the war. In September 1953, the School of Nursing employed its first dietitian as a full-time member of the faculty. Previously, our teaching dietitians had been members of the dietary department. A dietitian who had completed her internship at St. Marys Hospital was employed for the position. This was a distinct advantage since she was familiar with the dietary department—its educational opportunities, procedures, and personnel—and its problems. However, even with a full-time teaching dietitian and qualified clinical instructors to help carry out the integrated program, other problems remained.

Students had been assisting with tray service during their dietary experience, and if this experience were to be discontinued, adjustments had to be made in numbers and the schedules of non-professional personnel. There was a cost factor to consider. The student's educational experience would have much less service-value and the cost of the educational experience would be greatly increased. After much planning and many meetings of the curriculum committee, it was decided that the potential values of the program justified a trial, and the plan was approved by both the school and the hospital. The Minnesota Board of Nursing had also been consulted and had given its approval.

The next step was to implement the plan with new

methods of scheduling. When students are assigned to two medical wards, a general surgical ward and the pediatrics ward, they spend one week on each ward concentrating on diet therapy. Therefore the experience in these wards has been lengthened one week. Along with the block rotation of students to the designated wards, the assistant director of the School of Nursing plans the specific week each student is to concentrate on diet therapy. This assignment appears on the weekly changes for students and head nurses.

Since this is recorded as dietary experience, the clinical instructor in nutrition plans the daily schedule for students, including the assignment hours on the ward and conferences for the ten to fifteen students receiving diet therapy experience each week. These schedules are taken to the ward on Wednesday for the following week. Students are assigned five days' work a week, with Saturday and Sunday as their free days.

Who is responsible for these students? This is a decision needed before beginning such a program. Our students are responsible to the head nurse and team leader for matters of nursing. They are responsible to the clinical instructor in nutrition for learning dietary principles involved in care of their patients. The staff dietitians continue to be responsible for the over-all dietary care of patients. If a change in diet occurs during the day, the staff dietitians will process that change. Under the supervision of the clinical instructor in nutrition, the students plan diets which are served to the patients the following day.

These preliminary points were cleared efficiently and quickly because every person concerned was convinced that dietary care is a necessary part of total patient care. The continued cooperation of the dietitians, head nurses, and clinical instructors has been the underlying reason for the success of our integrated program which now has been in effect for almost two years.

Methods of Integration

The clinical instructor on the ward, the head nurse, and the clinical instructor in nutrition select several patients for each student. The number of patients depends on the experience of the student, the amount of care each patient requires, and the type of diet therapy desired. The student cares for these patients for the entire week, giving nursing care, medications, and planning the diet. She is with the patient two meals a day—feeding him if necessary, learning his diet, eating habits, and reactions to food. If a patient had difficulty in consuming the entire meal, the student continually tries to encourage him to eat.

The student daily plans the diet, calculating the caloric and protein intake for each patient. She compares this total with the National Research Council recommended allowances, and the calories and protein prescribed for the therapeutic diet. She makes other dietary calculations when necessary. For example: if a diabetic patient taking insulin is unable to eat all of his food, the student replaces the amount of carbohydrate he failed to eat with the appropriate amount of orange juice.

Each week the student audits at least one instruction in diet for a patient, including if possible a series of instructions for a diabetic patient. Under the supervision of the clinical instructor in nutrition, some students give dietary instructions during their third or fourth week. Because of scheduling difficulties, this is not possible for all students.

Instruction for the nursing students is carried on, using a small group-conference method, with a considerable amount of spontaneous clinical instruction, as timely questions are solved on the ward. With emphasis placed on the normal nutrition, the instructor points out how and why each therapeutic diet differs from the normal diet. The symbolism of food and sociologic factors is pointed out to help the student understand the patient's problems more effectively.

Each student is offered a total of 8 hr. instruction during the week, making a total of 32 hr. in four weeks. Students assigned to diet therapy experience for the first time receive a 2-hr. orientation class on Monday morning. In this class, principles common to the dietary care of all patients are discussed. Tray service, sanitation, procedures of writing diet cards, and methods of estimating caloric and protein intake are explained. Each morning during the remainder of the week, students from all wards meet for a half hour to plan the diets served to their patients the following day. They follow patterns in the diet manual and the dietary record card kept for each patient to determine individual food preferences. During the conference, the clinical instructor in nutrition acts as a resource person to advise, check, and correct the diets.

Five hr. of afternoon conferences are conducted individually with students on each ward, with 2 hr. spent in discussing and learning the dietary principles involved in care of their assigned patients. Sugar substitutes, salt substitutes, "salt-free" bread and butter, and any mineral or vitamin supplements their patients may be receiving are tasted. The students spend 2 hr. in oral presentation of patient-care studies on two of their patients. They compare the clinical history of their patients with the textbook picture of the disease. They discuss the relationship of symptoms, laboratory tests, and medications pertinent to the prescribed diets. They list the major factors in the dietary care of their patients and give the reason for each dietary principle. Foods the patient could eat at home or choose from a restaurant menu are suggested.

Evaluation of Students' Progress

A 20- to 30-min. quiz covering the dietary principles learned is given each week. A card file of test questions has been developed. This facilitates pulling out and combining of various questions covering the diets studied. Patients may be different each week, but individual test questions remain the same. After the student has completed four weeks of diet therapy experience, she is given problem-type questions covering the major factors in the dietary treatment of common patient conditions. The grades for the four quizzes and this final problem are averaged into one grade recorded for diet therapy. Thus evaluation of the student's progress is carried out by class participation, weekly quizzes, a final problem-type test, and appraisal records. An anecdotal comment is written on the appraisal records kept in the practice area and is discussed with the student at the end of each week.

Since the evaluation program begins as soon as the students begin their clinical experience, a great difference is noticed in their ability during the third and fourth week as compared with the first week. Though specific abilities are set up for each specialized ward, comparative evaluation of all students on one ward is difficult because students are not rotated to the wards in the same sequence. What may be the first diet therapy experience for one student may be the third for another. Thus evaluating students according to number of weeks of experience is more effective. After completion of four weeks' diet therapy experience, we consider these abilities when evaluating the students:

(a) Ability to integrate nutritional care with total nursing care of the patient.

(b) Ability to modify the normal diet to meet clinical conditions.

(c) Ability to adjust prescribed diets to meet the patient's social, religious, and economic needs.

(d) Ability to understand the psychologic implications of food for certain patients.

(e) Ability to give adequate informal dietary instruction to the patient.

Two years may elapse before the student is rotated to all designated wards. Spacing 32-hr. instruction throughout this period provides opportunity for continued learning and varied diet therapy practice. To reinforce clinical teaching, 5 hr. of diet therapy are integrated into the formal course of medical and surgical nursing in the areas of endocrinology, obstetrics, and pediatrics.

Nutrition and Cookery Instruction

A 32-hr. nutrition course is also offered nursing students at the end of their first year in training. This course is designed to give the student an understanding of the fundamental facts and principles of nutrition in relation to her own needs, those of her patients and of her community. The first diet therapy experience for some students may precede this nutrition course; for others, it is concurrent.

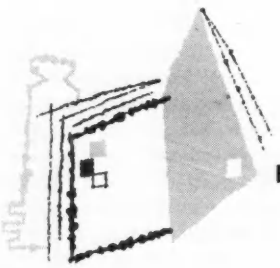
Following the course in nutrition, a practical pretest in cookery is conducted; those who pass are exempt from taking a 22-hr. laboratory course in cookery. For the test, the students are presented menus and recipes and are judged on their ability to prepare attractive luncheon menus, according to the principles of cookery, in the time allowed. Approximately 65 per cent of the students pass. If a passing student wishes to take the course, she is welcome to do so, and this frequently happens.

Each student prepares a full meal each time the cookery class meets, advancing from simple to more complex luncheon menus. Demonstration and discussion center around one class of foods each period, although students prepare full meals. Classes are scheduled over the meal hour, so that food prepared in class replaces their lunch in the dining hall. Common types of therapeutic menus are prepared during two laboratory classes. Students become familiar with foods included and methods used to improve the flavor of restricted menus.

Summary

Teaching nutrition and diet therapy in a total nursing situation has been found effective at Saint Marys School of Nursing, Rochester, Minnesota. This method has disadvantages as well as advantages. The time and energy required for this type of clinical instruction are expensive. This can be appreciated when calculating the time required to schedule hours, to select patients, to read clinical histories, to talk with patients, to plan and conduct conferences, to prepare appraisal records and quizzes, to correct papers, and to keep records.

The faculty at Saint Marys feels this method of teaching has brought about desired changes in attitudes and behavior on the part of the students. Students have time to understand their assigned patients, rather than one aspect of their care. Through complete care of these patients, the students learn in a vivid manner the physical and emotional significance of food. They realize it is easier to express depression by anorexia than by talking about it. They notice that a patient has an insulin reaction only when he fails to eat all of his food. They notice a decrease in the number of stools when a patient is on a low-residue diet. The student is better able to judge if the meal served to her patient is technically correct, and to question, if it does not meet the doctor's order with the same sureness that she would question an unusual dosage of a medication. With the complete integration of clinical dietary experience, the student is better able to assimilate the basic knowledge gained in medical and surgical nursing.



BOOK REVIEWS

Soil—The Yearbook of Agriculture 1957. Alfred Stefferud, Editor for the U.S. Department of Agriculture. Washington, D.C.: Government Printing Office, 1957. Cloth. Pp. 784. Price $2.25.

Recognizing that the soil is the basic medium on which we are dependent for our nutritional survival, careful appraisal of this volume gives one the security of recognizing that the science of agriculture has kept pace with other advances in man's knowledge.

This Yearbook of Agriculture is concerned with all aspects of management of the soil. It supersedes the 1938 yearbook, *Soils and Men.* More than 140 specialists have authored the various sub-sections of the volume. In spite of this multi-authorship, the editor has succeeded in unifying the style so that it proceeds smoothly and logically through a detailed discussion of the salient factors concerned with soil management.

Approximately half of the volume is devoted to a presentation of the basic scientific principles of soil management, methods for achieving fertile soil, conservation of moisture, and control of insects and erosion. Procedural systems for optimum soil management are discussed in detail with emphasis on characteristic regional differences in the soils of the U.S. A special section analyzes the particular soil management procedures for certain of our individual crops, such as rice, legume, pastures, orchards, and vegetables.

Although the information compiled here is basic for the professional farmer, and the text is written and illustrated for him, application of each soil management practice to the problems of the amateur home gardener is also made. This policy should result in a widely expanded group of interested readers.

Perhaps the section of primary usefulness to the dietitian is the discussion on plant nutrition and soil fertility. Here the reader is able to grasp clearly the concept that adequate fertility of the soil is essential for plant growth and that the primary outcome of a deficient soil is a poor crop yield. Thus, with our increasing knowledge of plant biology, our former concern about production of crops deficient in the essential nutrients becomes practically negligible at the present time.—*Helen Cate, Ph.D., Head, Department of Food and Nutrition, School of Home Economics, Florida State University, Tallahassee.*

Etude pour L'Établissement de Rations Alimentaires pour le Tuberculeux en Sanatorium. By F. Vinit and J. Tremolières. Monographie de L'Institute National D'Hygiène, No. 11. Paris: L'Institute National D'Hygiène, 1957. Paper. Pp. 187.

This study, carried out under the auspices of the nutrition section of the French National Health Institute, is a competent and stimulating effort to define desirable nutrient levels for tuberculosis patients in sanatoria. The nutrient needs of the tuberculous are taken up in detail in the first section. In the second, a most interesting study of the behavior of the tuberculous patient in relation to food is outlined.

The food offered to patients, the food chosen and consumed by them were studied. A comparison of these findings was then made with their theoretical nutrient needs. Seventeen institutions in different parts of France, serving men only, women only, and both sexes, were visited at different times of the year to allow for seasonal variations. Painstaking records were taken of purchase and cost items, food preparation and waste. Notations of the socio-economic and regional background of the patients were also made. Studies of waste considered the type inherent in certain foods, such as vegetable trimmings, as well as plate and other waste.

Some of the findings and the comments of the patients and hospital personnel would seem worthy of interest to many of us in this country. Lack of appetite, so frequently found, is probably a result of the disease itself and aggravated by antibiotic treatment and by emotional deprivation. These patients, cut off from their families and associates for long periods, become bored with food and attach exaggerated importance to it. The recommended dietary, moderate in caloric value with emphasis on protein, vitamins, and minerals is similar in its basic features to the one in current use in this country. With the use of antibiotics, there seems to be a lessened active tissue mass, and protein is more necessary (confirmed by Ohlson).

Making all due allowances for differences in situations in the two countries, some intriguing points are these:

(a) In a study of patients' dietaries before they became tuberculous, it was found that their food habits were not peculiar; however, anorexia and lack of energy resulted in lessened caloric intake.

(b) A marked difference was found in the type and amount of food eaten according to sex.

(c) The element of choice, even on a most modest scale, was of great influence in bettering the food intake and reducing waste. Strict quantitive control sometimes resulted in greater waste.

(d) The regional, as well as socio-economic, background markedly conditioned food choices.

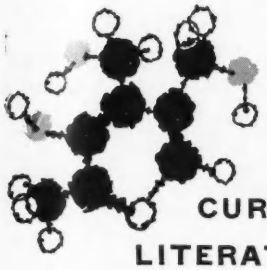
(e) In some instances, better nourishment was achieved by bed rather than collective dining, due to the encouragement given by attendants.

Among the recommendations are pleas for improved food preparation with attractive presentation and lessened variety but a greater possibility of selection by the patient. Definite suggestions are made for the foods which need greater emphasis: milk, cheese, and fruits. The creation of a homelike atmosphere is advised, such as using small tables in the dining rooms.

The importance of the role of the medical director and of the physicians caring for the patient is tellingly illustrated. In the institutions where the patients and the personnel know that the physicians had an interest in the food service and the patients' nutrition, a marked response and superior situation was noted.—*Marguerite J. Queneau, Associate Nutritionist, New York State Department of Health, Albany.*

Nutrition Manual for Nurses. Revised edition. By Alberta Dent Shackelton. Ithaca, New York: The author, 1957. Paper, spiral bound. Pp. 212. Price $3.75.

This *Manual,* the first edition of which appeared in 1951, is designed for use in teaching student nurses. It has been revised and enlarged to incorporate nutrition and diet therapy, as well as public health and community nutrition, and now replaces Volumes I and II formerly available. It is presented as a study guide for nurses in all nutritional aspects of nursing care. Emphasis is on patient-centered learning experience to help the nurse appreciate all the problems of the patients as well as the dietary needs.



CURRENT LITERATURE

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THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 5, November-December, 1957

*The role of protein in diets for weight reduction. V. P. Dole.—p. 591.

Tocopherol excess in man. Creatinuria associated with prolonged ingestion. R. W. Hillman.—p. 597.

A formula for estimating the specific gravity of the human body with a consideration of its possible uses. G. R. Cowgill.—p. 601.

*The role of nutritional factors in the cause, prevention, and cure of alcoholism and associated infirmities. R. S. Goodhart.—p. 612.

*The low-sodium diet. Some methods of making it more acceptable with special reference to the use of Bitters. M. Plotz.—p. 618.

*Effects of iron treatment of anemia in a tropical area. P. L. White, A. Quiroz, L. Gonzales-Mugaburu, S. Morales, J. Atkins, C. Collazos, and D. M. Hegsted.—p. 621.

*Serum cholesterol levels in school children from three socio-economic groups. N. S. Scrimshaw, A. Balsam, and G. Arroyave.—p. 629.

*Dietary survey on Raratonga, Cook Islands. III. Feeding practices and growth of Raratongan children from birth through six years. P. C. Fry.—p. 634.

*The effect of intrinsic factor on the absorption of vitamin B_{12} in older people. S. M. Chernish, O. M. Helmer, P. J. Fouts, and K. G. Kohlstaedt.—p. 651.

*Heredity factors in protein nutrition. P. F. Fenton.—p. 663.

*Adapting therapeutic diets to Jewish food customs. Diet Therapy. M. Kaufman.—p. 676.

Protein and Weight Reduction. Evidence indicates that obese patients can safely lose nitrogen during weight reduction. Some loss of nitrogen may be a proper part of reduction, since the obese subject probably has more than a normal amount in his body. Although in principle it is clear that the aim of a reducing diet should be a normal body composition, as well as a normal weight, there are no reported studies that relate the proportions of different reducing diets to changes in body composition. As an empirical measure for causing weight loss, a high-protein diet has no proved advantage over simple quantitative limitation of a diet containing a normal proportion of protein. The theory that high-protein diets stimulate metabolic rate, thus accelerating weight loss, is not supported by actual tests. An abnormally high percentage of protein may depress appetite, but other reducing diets with more moderate proportions of protein probably have no significant effect on appetite. On the other hand, Dole and co-workers have shown that caloric appetite can be limited by reduction of protein intake. Subject to the restriction of protein (about 35 gm. daily), patients chose less non-protein calories.

Nutritional Factors and Alcoholism. This article summarizes the knowledge of nutrition and alcoholism and indicates those areas where information is inadequate. Rats, when maintained on diets deficient in certain of the B vitamins, develop a markedly increased voluntary consumption of ethyl alcohol, apparently because of the body's need for utilizable calories. With sufficient amounts of the missing vitamins, the animal quickly tends to lose its excessive appetite for alcohol. There is no evidence that a similar mechanism operates as a major, primary cause of alcohol addiction in man. This possibility has never been satisfactorily investigated. Malnutrition plays an important role in the perpetuation of excessive drinking in many alcoholics who develop deficiencies as a result of their alcoholism. As with the rat, such persons may acquire metabolic blocks and rely on alcohol as a utilizable source of energy. This requires investigation. More obvious is the causal relation of the painful, disabling, and embarrassing nutritional diseases in the alcoholic to the perpetuation of excessive drinking. The correction of such physical and mental ills is a prerequisite to the successful management of the alcoholism itself, and sometimes brings about a complete cure. While alcohol is toxic to man, its known effects are acute in nature. The major, chronic, organic disorders associated with alcoholism, and often considered stigmata of alcoholism, are manifestations of nutritional disturbances. They can occur in total abstainers who have developed nutritional deficiencies and can be prevented by proper nutrition.

Bitters for the Low-Sodium Diet. With the exercise of some ingenuity, the low-sodium diet can be made quite palatable. A list of spices is given which can add zest and variety to the flat taste of salt-free food. Angostura Bitters were found to be an exceptionally acceptable flavoring agent over a three-month trial for 93 out of 100 patients. The sodium content of Angostura Aromatic Bitters is unexpectedly low—one "dash" (1.3 ml.) contains 0.05 mg. sodium and 1 tsp., 0.16 mg. sodium. This product, although produced by secret formula, is a mixture of aromatic spices, such as cloves, cinnamon, mace, sweet orange peel, cardamon, with gelatin in an alcoholic menstrum. The amount used varies with taste, but is usually about 1 ml. to an average portion. Suggestions for adding taste to vegetables and meats are listed in this article.

Iron Therapy in a Tropical Area. Anemia is common among population groups suffering from various parasitic infestations. This is thought to be primarily an iron-deficiency anemia produced by chronic blood loss. Iron therapy has long been used, but there have been numerous reports as to the effectiveness of this treatment. Girls, heavily infected with parasites, served as subjects in a study to determine the iron requirements in a Peruvian jungle area. The average hemoglobin level was 9.8 gm. per 100 ml. Four groups were given placebos, 15, 30, and 50 mg. iron as ferrous sulphate daily for periods up to fourteen weeks. The hemoglobin response was essentially maximal within six weeks. All levels of iron used appeared to be equally effective. The group receiving 50 mg. iron maintained their hemoglobin levels for three months after iron was stopped, but had returned to pretreatment levels within eight months. The other groups were not studied. Dietary surveys in this area indicate that iron intakes are reasonably satisfactory—the mean intake being 12 mg. per day. The total iron requirement to maintain the hemoglobin at about 10 gm. per 100 mg. would appear to be somewhat less than 25 mg. per day. Thus, relatively small increases in the iron intake proved beneficial. Means should be sought by fortification and/or dietary instruction to increase the iron intake. Anemia is wide spread in this area and, undoubtedly, is related in large part to hookworm disease.

Serum Cholesterol of Children. Serum cholesterol levels appear to be low in children at birth, and at this time, to be independent of the diet, race, and cholesterol level of the mother. They have been reported to rise during the first two years of life to levels within the adult range. During childhood and adolescence, most observers have found no consistent variations with either age or sex. Since marked differences in serum cholesterol levels among adults in different socio-economic groups in Guatemala have been noted, it was of interest to determine whether school children showed the same trend as their parents. Total serum cholesterol was determined in children selected at random for each age from seven through twelve years from the following three population groups: urban, upper-income business and professional families; urban lower-income families living in a poor district of Guatemala City; and lower-income families in a rural village. The first

group consumed about 69 gm. protein daily and received 37 per cent of their calories from fat as compared with 47 gm. and 15 per cent for the urban, lower-income families and 67 gm. protein and 8 per cent for the rural group. Amounts of animal protein consumed by the groups were: 39, 10, and 6 gm., respectively. The serum cholesterol levels showed no age differences within groups. The average cholesterol values for boys were: urban, upper-income, 187.2 mg. per 100 ml.; urban, lower-income, 143.0; and rural, lower-income, 121.1 mg. Corresponding values for girls were: 187.6; 156.0; and 127.7 mg. per 100 ml. Differences among the groups were statistically significant. Hence, the differences in serum cholesterol among adults in Guatemala is also present in children, even though all levels are low at birth.

Cook Island Children. This article concludes a three-part survey of nutritional - anthropologic interrelationships in Polynesians and indicates how social factors affect the growth and development of the young. It was found that programs to alter the care and feeding of children on Rarotonga have had no profound effects. Rather, the desire of the Maoris to emulate Europeans in order to become successful in business has led to some changes in the rearing of children. Most children under one year are partly or entirely breast fed. Solid foods are started at about four to five months, but protein foods of high biologic value are not often added until ten months. There appeared to be few rigid cultural rules concerning child care and feeding. Regarding growth, Maori children are not as tall as Iowa children at any age, but appear to be more muscular than their American counterparts. Clinical signs of malnutrition are very rare, but general morbidity and infant mortality are high. After two and a half years of age, the children probably have adequate protein and calories. It appears that prenatal and lactation diets are adequate in protein and calories. In view of the fact that Polynesians are traditionally described as one of the tallest races in the world, it is strange that these Rarotongan children are not taller. It is felt that some unfavorable environmental factors other than diet affect their height.

Intrinsic Factor and Vitamin B_{12} Absorption. The metabolism of vitamin B_{12} was studied in middle aged and elderly people by using both plasma levels and urinary excretion studies as measured by the Schilling test. The findings indicate not only that plasma level declines with aging, but that a few non-pernicious-anemic patients may have deficient absorption. The oral administration of active intrinsic factor preparations enhanced the absorption of vitamin B_{12} in those subjects who showed impaired uptake by the Schilling test but had no significant effect if absorption was adequate. Prolonged administration of oral vitamin B_{12} raised plasma levels significantly.

Heredity and Protein Nutrition. Evidence is accumulating that an individual inherits a characteristic metabolic pattern just as he inherits the color of skin, hair, and eyes. The basic premise is taken that an animal's genic make-up determines its endocrine balance which in turn establishes its metabolic pattern. In this study, four strains of mice differed somewhat in growth rates when fed normal diets. However, when the protein content of the diet was reduced to 10 per cent, marked differences in growth were observed. These may be explained on the basis of differences in voluntary food intake or of differences in efficiency of protein utilization. Both possibilities are discussed. Two strains had a markedly greater voluntary food intake, and of these two strains one had a significantly greater efficiency of protein utilization for growth. These experiments indicate that there are real differences in metabolic patterns aside from the inherited differences in voluntary food intake.

Jewish Food Customs. The food habits of Jewish people differ with each individual, depending on his degree of acculturation and whether he belongs to the Orthodox, Conservative, or Reform group. Orthodox Jews observe the dietary laws under all conditions; Reform Jews tend to minimize dietary laws; and Conservative Jews stand between these two groups. In this article, the dietary laws are explained. What foods can be eaten are noted, as well as methods of preparation and the manner in which they are to be eaten. Modifications for adapting therapeutic diets to Jewish food customs is discussed. A list of definitions of common Jewish foods is given.

THE AMERICAN JOURNAL OF MEDICINE

Vol. 23, November, 1957

Hormonal influences on the serum lipids. Seminar on atherosclerosis. D. Adlersberg.—p. 769.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 47, October, 1957

*A diet instruction service for private patients—a pilot study. M. A. Bouton and A. P. Meredith.—p. 1290.

Diet Instruction Service. A pilot study is described which was conducted in Schenectady, by the Public Health Service, in cooperation with the Bureau of Nutrition of the New York State Department of Health, in order to determine the extent physicians would use a nutrition service if offered through a local health department. Patients received dietary counseling from the nutritionist without fee when referred by the private physician. Although the study was originally scheduled for a two- to three-year period, it was concluded after 21 months when it was apparent that no further information would be obtained. During the first 18 months, only 35 physicians out of the 93 included in the study had referred 78 patients. The greatest number referred by one physician was 13. There appeared to be a lack of awareness on the part of the physicians of the kind of detailed help their patients needed. This can not entirely be construed as a reflection on the physician. Many patients are reluctant to mention dietary matters to the physician; hence, the questions naturally go unanswered.

AMERICAN JOURNAL OF SURGERY

Vol. 94, November, 1957

*A statistical analysis of the fluid and electrolyte requirements of surgical patients. C. O. Rice, J. H. Strickler, and V. Weckwerth.—p. 727.

Fluid and Electrolyte Needs in Surgery. From the standpoint of practical usage of polyionic fluids for parenteral administration and alimentation, the safest base line or starting point solution should be one containing the minimum quantity of each electrolyte for any of three periods of study, pre-operative, day of surgery, and post-operative. Ideally, three separate solutions should be used to meet these requirements. A more practical approach suggests a single solution containing 6 gm. nitrogen, 17 mEq potassium, 22 mEq sodium, and 23 mEq chloride per liter. Stock concentrates of the three major electrolytes could then be employed to add to the basic solution when necessary. From the study conducted, potassium, sodium, and chloride have estimation intervals of nearly the same magnitude for each of the three divisions of the surgical period.

BRITISH MEDICAL JOURNAL

No. 5053, November 9, 1957

*Aspirin and diabetes mellitus. J. Reid, A. I. MacDougall, and M. M. Andrews.—p. 1071.

Aspirin and Diabetes Mellitus. Disappearance of glycosuria and the trend of fasting blood sugar to normal in a young person with diabetes during aspirin treatment for acute rheumatism led to re-investigation of the effect of salicylate in diabetes mellitus. An intensive two-week course of aspirin abolished glycosuria and lowered the fasting blood sugar to normal or near normal in seven patients with mild to moderately severe diabetes. No decisive effect on glucose tolerance was obtained, though the blood-sugar curves were always lower during aspirin administration than they were either before or after. Moderate ketonuria in two patients was reduced to normal with aspirin. Clinical improvement accompanied the

biochemical changes induced by aspirin, and, while serious toxic manifestations were not conspicuous, tinnitus and deafness were annoying. The possible place of aspirin in the treatment of diabetes is discussed. The action of aspirin in diabetes mellitus has been located in the tissues, and this is of interest in the light of the proper establishment of the drug as a peripheral acting stimulant.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 77, November 15, 1957

*Maintenance therapy of pernicious anaemia with oral administration of intrinsic factor and vitamin B_{12}. L. Lowenstein, L. Brunton, L. Shapiro, N. deLeeuw, and M. Dufresne.—p. 923.

Therapy of Pernicious Anemia. Thirty-six patients were maintained for a three-year period on oral administration of daily doses of vitamin B_{12} and hog pyloric mucosa as a source of the intrinsic factor. At the end of this period, nineteen patients had developed megaloblastic relapse of the bone marrow and four showed definite evidence of relapse of the blood, although no clinical relapses were observed. An additional ten patients exhibited abnormally low serum B_{12} levels. Oral administration of small amounts of vitamin B_{12} with desiccated hog pyloric mucosa as a source of intrinsic factor is not a satisfactory method of maintenance therapy in Addisonian pernicious anemia.

DIABETES

Vol. 6, November-December, 1957

*An abnormality of nonesterified fatty acid metabolism in diabetes mellitus. E. L. Bierman, V. P. Dole, and T. N. Roberts—p. 475.

The nature of diabetic (Kimelstiel-Wilson) glomerulosclerosis. M. J. G. Lynch and S. S. Raphael.—p. 488.

*Urinary excretion patterns of some B-vitamins in diabetes. A study in patients with and without degenerative complications. J. B. Field, D. D. Federman, E. McDaniel, and H. Bakerman.—p. 508.

*Hyperglycemic effect without anabolic effect of beef growth hormone in man. E. R. Froesch, W. F. Ganong, H. A. Selenkow, W. Goodale, A. E. Renold, and G. W. Thorn.—p. 515

Nonesterified Fatty Acids. The nonesterified fatty acid (NEFA) fraction of plasma, with its exceedingly rapid turnover, appears to be a major link in the transport of fatty acids from depots to liver and peripheral tissues. Recent observations suggest that insulin causes a fall in the concentration of NEFA in plasma by inhibiting the release of fatty acids from tissue stores. It appears to have no effect on the removal of NEFA from plasma. It seems probable that the abnormality of NEFA metabolism in diabetes is an impaired ability to limit the output of fatty acids from tissue stores, resulting from an impaired utilization of glucose by the adipose cells. In ketosis, the defect has become extreme, and the body is flooded with a surplus of fatty acids exceeding its capacity for oxidation or synthesis of esters. Treatment with insulin checks the output of fatty acids and removes the primary cause of acidosis, but does not immediately cure ketosis, since the accumulation of ketone bodies in blood and tissues is more slowly removed. This interpretation of ketosis is no more than a working hypothesis, and the chronic disturbances of lipid metabolism in diabetes have not been studied in relation to NEFA. Since measurement of NEFA is a relatively simple matter, it might prove useful in the clinic, supplementing blood glucose, as an index of diabetic control.

B-Vitamin Excretion in Diabetes. The urinary excretion patterns of thiamine, riboflavin, pantothenic acid, niacin, and vitamin B_{12} were studied in normal subjects and in diabetic persons with and without degenerative complications. It was impossible to determine any definite relationship between the development of the degenerative complications of diabetes and the excretion patterns of the five B-vitamins tested.

Beef Growth Hormone in Man. The biologic properties of growth hormone preparations presently available are poorly defined and vary greatly from species to species. It is thought that growth hormone has an effect on anabolism and on carbohydrate metabolism. Growth hormone, by definition, stimulates growth of certain tissues, and thereby induces retention of nitrogen, potassium, calcium, and phosphorus. The production of hyperglycemia, glucosuria, and sometimes permanent diabetes mellitus is the best documented and most consistent effect of relatively large doses of growth hormone on carbohydrate metabolism. The ideal patients in whom to assess the value of currently available growth hormone preparations are hypopituitary dwarfs with immature epiphyses and well-documented arrest of growth. The authors have had the opportunity of carrying out prolonged administration of beef growth hormone to such a patient. No significant growth resulted with the growth hormone, whether alone or combined with other anabolic hormones. Also, no significant change indicative of anabolic activity was noted in the metabolic indices measured. However, mild hyperglycemic activity of the hormone was suggested by small but significant changes in urinary glucose excretion and by suddenly increased insulin sensitivity after cessation of therapy. The hyperglycemic activity of the beef hormone can be confirmed in a second study, carried out over a shorter period in an hypophysectomized diabetic subject. This subject had a marked exacerbation of glucosuria as well as fasting and postprandial hyperglycemia. These results indicate that the hormone preparation used was active in man with respect to carbohydrate metabolism. Failure to detect anabolic effects can suggest a dissociation between the anabolic and the carbohydrate effects of beef growth hormone in man.

FOOD TECHNOLOGY

Vol. 11, October, 1957

*Effect of maturity and storage temperature on quality of frozen peas. W. C. Dietrich, F. E. Lindquist, and M. M. Boggs.—p. 485.

*Delaying vegetable spoilage with antibiotics. V. J. Carroll, R. A. Benedict, and C. L. Wrenshall.—p. 490.

*Effect of glucose removal on storage stability of egg yolk solids. P. Paul, H. Symonds, A. Varozza, and G. F. Stewart.—p. 494.

*Factors affecting quality of prepackaged meat. II. Color studies. A. Effect of package characteristics upon color of product. J. A. Rikert, C. O. Ball, and E. F. Stier.—p. 520.

Vol. 11, November, 1957

*Further studies on the preservation of beef with chlortetracycline. J. M. Jay, H. H. Weiser, and F. E. Deatherage.—p. 563.

*Factors affecting quality of prepackaged meat. II. Color studies. B. Effects of storage time, storage temperature, antioxidants, bacteria, light, freezing and fat upon color of product. J. A. Rikert, L. Bressler, C. O. Ball, and E. F. Stier.—p. 567.

*Correlation between flavor and number of microorganisms associated with eviscerated chicken treated with chlortetracycline. A. F. Carlin, B. E. Hall, and H. W. Walker.—p. 573.

*A survey of the bacteriological quality of frozen poultry pies. E. Canale-Parola and Z. J. Ordal.—p. 578.

*Freeze-dried meat. V. Preparation, properties, and storage stability of precooked freeze-dried meats, poultry, and seafoods. A. L. Tappel, R. Martin, and E. Plocher.—p. 599.

*Effects of packaging on partially baked rolls: observations on the retention of riboflavin, moisture, and flavor. J. J. Birdsall and L. J. Teply.—p. 608.

Stability of Frozen Peas. It has been indicated that variation in maturity of peas could account for part of the variation in storage life of this product. Storage stability studies were done on Thomas Laxton peas at three maturity levels. Samples were stored at −30°, −10°, 0°, and 10°F. for time intervals of from zero to 69 weeks. Changes in ascorbic acid, flavor, and color scores were observed. Small and immature peas were more susceptible to deterioration than the large and mature peas.

Vegetable Spoilage and Antibiotics. Modern techniques in handling and shipping vegetables have reduced losses substantially, but bacterial decay causes serious losses. Solutions of oxytetracycline hydrochloride, streptomycin sulfate, and polymyxin B sulfate were tested for decay control in six vegetables. Only oxytetracycline gave good control of spoilage. Oxytetracycline controlled spoilage up to 48 hr. at 30°C.; longer delay of decay was obtained at 5° and 10°C. Streptomycin was the second most effective antibiotic treatment, and polymyxin was least.

Stability of Egg Yolk Solids. One problem in the use of egg yolk solids is their susceptibility to changes in color, flavor, and functional properties during storage which usually adversely influence the foods in which they are used. It is known that many of these changes arise from a maillard-type reaction involving glucose naturally present in eggs. The storage stability of yolk solids stabilized by enzyme treatment was investigated as compared with yolks without enzyme treatment. Samples of each lot were stored at 95°F. for 7, 14, 25, 40, and 90 days, and at 68°F. for 3, 6, 9, and 12 months. Doughnuts were selected as the product in which to test the quality of egg yolks on the basis of fat content, specific volume, and eating quality. Enzyme treatment improved the storage stability of egg yolks at 95°F.; the untreated samples gave doughnuts a lowered fat content and decreased palatability as the storage time increased. Similar results, although the differences were much smaller, were obtained in the 68°F. storage series.

Color of Prepackaged Meats. The effect of package characteristics on the color of meat was studied. Cellophane-acetate-pliofilm laminate was one of the best packaging materials for maintaining color in cut and in ground samples of lamb (7 to 12 days' storage). Vinyldene copolymer was the best for packaging lean ground beef to retain color, and cellulose acetate was best for fat ground beef. Cellophane-plioform laminate proved best in ground lean and fat pork. Results apply to color only.

Preserving Beef with Chlortetracycline. The phenomenon wherein low concentrations of chlortetracycline inhibits resistant strains of *Proteus, Pseudomonas,* and other bacteria in beef, but not in complete nutrient media was further characterized. Oxytetracycline and tetracycline acted similarly but not as effectively as chlortetracycline. Streptomycin, chloramphenicol, and penicillin were not effective. Significant inhibition of strains of *Proteus* could be observed with inocula as high as 65,000 per gram. Inocula over 150,000 per gram, were not consistently inhibited. Of a group of resistant bacteria commonly associated with beef, around 70 per cent were affected by 5 p.p.m. chlortetracycline. It is suggested that the tetracycline antibiotics are effective in retarding meat spoilage due to their ability to disturb the ionic balance in the product.

Packaging and Color of Meat. This article is second in a series on the quality of prepackaged meats and deals with color studies. The effects of storage time, storage temperature, antioxidants, bacteria, light, freezing, and fat on the color were investigated. The rates of change increased with the storage temperature. Ascorbic acid in low concentrations usually improved the color of ground meat in all types of packages used. However, ascorbic acid added to cut samples was deleterious to the color. Nordihydroguaiaretic acid (NDGA), in general, caused no improvement in the meat color. Inoculation with *Achromobacter* improved the color, but this improvement was restricted to the first ten days of storage, after which the non-inoculated samples were higher in redness. Light had little effect on the color of fresh meat. Storage of cured meat resulted in quick loss of redness. In comparison with fresh meat, the previously frozen and thawed meat was initially lower in redness value. There is evidence that lean surfaces of samples in contact with a layer of fat were redder after about one week's storage than the surface of the meat in contact with the packaging material. Between the first and fourth days of storage the surface covered with fat was less red than the uncovered surface.

Antibiotics and Flavor of Broilers. This investigation was conducted to determine whether there was a correlation between the flavor and the number of microorganisms that occurred on untreated control or on antibiotic-treated, fresh, cut-up broilers stored in a refrigerated display case. Untreated control and antibiotic-treated whole birds were stored for various periods of time in crushed ice until removal for preparation for the display case. Comparisons were made between two types of packaging material. Scores for meat flavor indicated that as storage time increased, a gradual deterioration in quality of the chicken occurred, regardless of packaging or antibiotic treatment. The antibiotic treatment retarded growth of bacteria whether the bird was stored whole in crushed ice or cut up, packaged, and stored 24 or 48 hr. in a display case. Microorganisms increased and flavor decreased in the untreated birds. The antibiotic treatment was limited to inhibiting the growth of the bacteria, since the flavor of the untreated and treated samples did not differ significantly. It is suggested that other undetermined factors are equally or more important than bacterial counts in determining flavor of stored poultry.

Bacteria in Frozen Poultry Pies. Precooked frozen chicken and turkey pies as produced by five different manufacturers were examined quantitatively for bacterial contamination. Unbaked frozen pies differed in amount of bacterial contamination among the five brands, probably reflecting the nature of the sanitary and technologic methods followed. Of 40 unbaked pies tested, 20 had total counts above 100,000 per gram, and 18 had coliform counts above 10 per gram. Enterococci were present in all samples tested and coagulase-positive *Staphylococci* were detected in 37 pies. Five Salmonella cultures were isolated from the unbaked pies. Data indicated that baking time and temperatures specified for some of the brands were not sufficient to cause destruction of non-spore forming organisms. Since frozen pies contain microorganisms of food poisoning potential, it is suggested that (a) efforts be directed towards introducing improved technologic and sanitary measures during preparation, (b) further consideration be given to the baking times suggested on each package, and (c) pie crusts be formulated which brown more slowly during baking.

Freeze Drying of Meats, Poultry, and Seafoods. Precooked freeze-dried beef, pork, veal, lamb, chicken, turkey, salmon, tuna, shrimp, and oysters were prepared. Time required for freeze-drying was mainly a function of thickness. Rehydration in 212°F. water at atmospheric pressure was poor. Some of the meats, poultry, and seafoods had good organoleptic properties; most were stable for six months at 70°F. and 100°F. storage. Samples stored at 130°F. developed a desirable flavor by browning during the first two months and began deteriorating thereafter. Water vapor equilibria of precooked freeze-dried beef and pork are favorable for freeze-drying and use of in-package desiccation.

Packaging of Partially Baked Rolls. It has been observed that exposure of cellophane-wrapped rolls to artificial light resulted in significant losses of riboflavin after two days. Hence, two studies were conducted to compare the relative effects of three wrapping materials on the retention of riboflavin, moisture, and flavor in partially baked rolls. The results of storage of the rolls under 100 foot candles of light revealed significant losses in riboflavin during the first seven days' storage when packaged in typical commercial cellophane and waxed paper. Such losses were not observed in rolls packaged in aluminum foil. Slight losses in moisture were quite comparable among the three test packages. Definite, undesirable changes in flavor in the rolls occurred after seven days when packaged in cellophane. Foil-wrapped rolls showed better retention of flavor and texture than did rolls wrapped in waxed paper and cellophane.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 5, November, 1957

*Effects of processing conditions on the chemical properties of canned

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sweet potatoes. J. C. Arthur, Jr. and T. A. McLemore.—p. 863.

Sweet Potato Canning. Effects of processing conditions on the chemical properties of two varieties of sweet potatoes were determined. The beta-carotene content of the canned potatoes was relatively stable during processing. The ascorbic acid content was reduced during processing. The dry weight of the cooked potato was about 80 per cent sugar, averaging 120 to 150 gm. per No. 2 can.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 165, November 9, 1957

*Slimming. Foreign Letters–United Kingdom.—p. 1304.

*Diet and pregnancy. Foreign Letters–United Kingdom.—p. 1304.

Vol. 165, November 16, 1957

*Treating overweight patients. G. L. Thorpe.—p. 1361.

*Plasma sodium. Foreign Letters–India—p. 1470.

Vitamin B complex and estrogens in oral cancer. Foreign Letters–India —p. 1471.

*Kwashiorkor. Foreign Letters–India. —p. 1471.

Vol. 165, November 23, 1957

*Milk allergy—diagnostic aspects and the role of milk substitutes. J. H. Fries.—p. 1542.

*Serum iron changes in anemia. Foreign Letters–India—p. 1621.

Vol. 165, November 30, 1957

*Use of sea salt. Queries and Minor Notes.—p. 1769.

*Effect of niacin on the kidney. Queries and Minor Notes.—p. 1770.

*Iced drinks postoperatively. Queries and Minor Notes.—p. 1770.

Slimming. A twenty-year-old girl weighing over 160 lb. lost 36 lb. in four months but was a nervous and physical wreck. Insomnia developed, and she took an overdose of sleeping pills. Autopsy revealed that she also had severe liver damage which was consistent with taking dextro-amphetamine sulfate over several weeks. The damage was severe enough to have ultimately caused death had she not taken the sleeping pills.

Diet and Pregnancy. A survey of a thousand pregnant women was carried out by the Ministry of Food and Agriculture of Great Britain. About two hundred had a particular desire to eat coal; others desired tooth paste, whitewash, wallpaper, and plaster. Pickles and cereals were popular, but the most frequent craving was for raw fruit, usually apples or oranges. Some had an aversion for foods normally enjoyed, and some found smoking distasteful. With some, the cravings were constant with each pregnancy, but in others they were different. The cause of these desires is not known, but it is suggested that it may be associated with the disturbance of mineral or vitamin equilibrium due to extra demands of pregnancy. Many of the women made great efforts to keep their cravings secret from their husbands.

Treating Overweight Patients. This article is somewhat confusing, and it was a surprise to find such an article in the *Journal of the American Medical Association*. The author, a physician of Wichita, Kansas, does have an awareness of the need to individualize the approach to dieting. He criticizes the method of handing out drug prescriptions and printed diet lists. His understanding of dieting attitudes appears to be on the right track, but his concept of nutritional needs and practicality seem inadequate. He follows the concepts of Pennington in advocating a high-protein, high-fat, low-carbohydrate diet. The total quantity eaten is not important, but the ratio of three parts of lean meat to one part fat must be maintained, as it is claimed that any decrease in the fat portion will reduce weight loss. Just what he considers lean meat is not indicated. He explains how this ratio affects ketogenesis and the benefits of it. Two to four weeks is about the limit a patient will continue this meat-and-fat diet supplemented only with black coffee, clear tea, and water. At the first complaint, it is modified by the addition of all 3 and 5 per cent fruits and vegetables for the sake of variety. He feels that cereals and milk are excellent foods, but have no place in the diet of the overweight patient. To maintain weight after reduction, he modifies the meat, fruit, and vegetable diet some. He has no evidence of clinical studies. It would be interesting to see how many of his patients have followed this plan and how successfully.

Plasma Sodium and Potassium. Sodium and potassium play an important role in maintaining the reaction of tissue fluids, osmotic equilibrium, excitability of tissues, and physiologic amounts of water in the different compartments. The degree of sodium and potassium imbalance in surgical conditions was studied when different types of fluid were given. The plasma potassium level was reduced while the plasma sodium level showed a concomitant rise in patients who underwent surgical operations and received solutions of sodium chloride, glucose, or plasma substitutes. This change was only temporary, the values of both electrolytes returning to normal after 48 hr. without the administration of any potassium salt. Blood transfusions did not significantly alter these levels. Thus, not enough hypopotassemia was observed after operations to justify giving potassium salts. Blood transfusion is necessary to prevent hypopotassemia when stress conditions tend to persist.

B-Complex and Estrogens. Various etiologic factors, such as deficiency of the constituents of the B-complex, alteration in metabolism of sex hormones, tobacco chewing or smoking, dental sepsis, and syphilis have been associated with precancerous lesions. The authors studied sixteen men with oral cancer; normal men served as controls. The excretion levels of thiamine and riboflavin were lower than normal and that of estrogens higher in the cancer patients. Administration of vitamins increased the excretion of estrogens in the cancer patients but not in the controls. Estrogen administration decreased thiamine and riboflavin excretion in the cancer patients, but not in the controls. It was indicated that there was a gross deficiency of thiamine in the cancer patients; urinary output of riboflavin was also low. The basal excretion of estrogens in the patients was significantly higher than in the controls. Loading the body with exogenous estrogens created a state of extraordinary deficiency of thiamine and niacin which are involved in estrogen metabolism. Vitamin administration increased the estrogen excretion, the increase being helpful in restoring hormonal imbalance. Estrogen treatment appears to be harmful in men with oral cancer, as it induces a deficiency of thiamine and riboflavin.

Kwashiorkor. Research was done to determine the serum sodium, potassium, calcium, magnesium, blood urea, total plasma protein and plasma albumin levels, prothrombin time, and degree of the eosinopenic response to epinephrine in two groups of patients with kwashiorkor, one given 60 and one 100 gm. protein daily. Results are presented. The patients who were given the high-protein diet showed no advantage with regard to either clinical improvement or regeneration of serum albumin.

Milk Allergy. Allergy to cow's milk is not as frequent as uncritical evaluation would make it seem, and many of the disturbances induced by milk are not of allergic etiology. Among the author's own patients, 5 per cent report having had clinical symptoms referable to cow's milk, but less than 0.3 per cent of his patients proved to be allergic to it. A food can cause gastrointestinal upsets and many other symptoms by virtue of non-antigenic components, special toxins, physical properties, poor preparation, or bacterial contamination. Real allergy to raw cow's milk can be overcome in many cases by boiling to denature the offending protein, usually the lactalbumin, or using evaporated milk. It may be necessary to avoid bovine products entirely and use goat's milk, a meat-base formula, predigested casein with certain additives, or a vegetable-base milk, such as those made from soybeans. It is felt that there are many potentially deleterious effects referable to the soybean. Investigation is urgently needed on soybean milk. Included in these studies should be the long-range effects of the antitryptic and hemagglutinating factors, of imbalance of essential amino acids, and of soyin and the goitrogenic toxins. It would seem preferable to use the vegetable milks only when mammalian

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milk is definitely not tolerated. Since infants have been known to lose their sensitivity to cow's milk, it should be retried at reasonably frequent intervals.

Serum Iron Changes in Anemia. These investigators stated that the serum iron level is normal or high in uncomplicated nutritional macrocytic anemia. It was accidentally observed that an initial hypoferremia occurred in such patients two or three days after the institution of specific therapy. Of twelve patients studied, all but two of them showed satisfactory response to specific therapy. These ten were patients with uncomplicated nutritional macrocytic anemia. The other two had an associated iron deficiency and required additional iron therapy. The sharp fall in the serum iron level seen in uncomplicated cases may be the earliest index of satisfactory erythropoietic response as an indicator of erythropoietic improvement. The fall is presumably due to rapid utilization of circulating iron for erythropoiesis.

Use of Sea Salt. The question is presented as to whether sea salt could be used as a substitute for fluoridating water supplies. The listed analysis of one commercial preparation of sea salt is 33 p.p.m. fluorine. Assuming an intake of 10 gm. salt daily, this might be compared with 1 mg. fluorine supplied in 1 qt. water fluoridated to 1 p.p.m. Although a specific toxicity test has not been conducted, data obtained on rats indicate that sea salt is less toxic than purified sodium chloride. In fact, in conditions where the diet is limited in the B-complex vitamins, there appears to be a beneficial effect from feeding sea salt, although one is unable to explain this protective action.

Effect of Niacin on the Kidney. There is general agreement that niacin causes vasodilatation of the peripheral vessels in the skin. It is not known and in the absence of a positive statement, it would appear that niacin does not have any vasodilating effect on the kidney. Niacin is excreted by the kidney and found in the urine. There is no indication that niacin would produce a diuretic action.

Iced Drinks Postoperatively. From the viewpoint of a gastrointestinal physiologist, it is hard to see why drinks of any kind, even iced, could disturb a patient after abdominal surgery. Cold might be a stimulant to peristalsis, but, if the fluid stays for a few minutes in the stomach, it will be warmed up.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 36, November, 1957

*Biochemical changes in liver associated with kwashiorkor. H. B. Burch, G. Arroyave, R. Schwartz, A. M. Padilla, M. Béhar, F. Viteri, and N. S. Scrimshaw.—p. 1579.

Liver Changes in Kwashiorkor. Chemical changes in the liver and serum during treatment of thirteen children with kwashiorkor are reported. Results of similar analyses on liver autopsy specimens from five St. Louis children dying from causes unrelated to kwashiorkor are also included, together with analyses of livers from twelve rats, to confirm the validity of studying autopsy material. The increase in protein and the decrease in total lipid with treatment were marked. Concomitantly, there were striking increases relative to protein in xanthine oxidase and D-amino acid oxidase. During treatment of children with kwashiorkor, no significant changes relative to protein were found in the following substances in liver: riboflavin, glycolic acid oxidase, DPNH-dehydrogenase, malic dehydrogenase, transaminase, oxidized pyridine nucleotides, and cholesterol. The levels for all substances measured in the livers of patients with kwashiorkor after treatment were generally equal to those of autopsy specimens of St. Louis children, except for glycolic acid oxidase and xanthine oxidase. Protein in serum increased 70 per cent during treatment and relative to protein, cholinesterase increased 100 per cent and amylase 30 per cent. The red blood cell riboflavin doubled.

THE JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 19, November, 1957

*A nutrition survey of young women in residence at the University of Manitoba. L. M. Miller—p. 21.

Nutrition Survey of Coeds. A nutrition survey was carried out among eighty-four girls living in residence at the University of Manitoba. Intakes were generally satisfactory in protein, fat, calcium, phosphorus, thiamine, riboflavin, and niacin. No diet was low in ascorbic acid. Iron ranked first and calories second in the nutrients most inadequately supplied. The other nutrients in decreasing order of the extent they were found to be deficient were: vitamin A, riboflavin, calcium, protein, thiamine, phosphorus, and niacin. Blood levels of hemoglobin, vitamin A, and ascorbic acid were below average in 70 per cent or more of the girls, and the carotene level was low in 15 per cent. Thirteen to 23 per cent had low body stores of thiamine, riboflavin, or niacin as shown by no excretion in the urine. Anthropometric measurements revealed that less than half the girls were within the normal weight range and that more girls were underweight than overweight. Home economics girls appeared to have a smaller extent of nutritional deficiencies than the others. It was felt that university women should be classified as sedentary rather than moderately active. Ten per cent of the total number of meals were omitted altogether and the majority of these were breakfasts. A large number of snacks were taken.

JOURNAL OF PEDIATRICS

Vol. 51, July, 1957

*Nitrogen metabolism of infants fed human and cow's milk. L. A. Barness, D. Baker, P. Guilbert, F. E. Torres, and P. György.—p. 29.

*Effects of lactose on nitrogen metabolism and phenol excretion in infants. D. A. Cornely, L. A. Barness, and P. György.—p. 40.

Vol. 51, September, 1957

*Influence of L-lysine supplements on the absorption and retention of nitrogen from milk by children with protein malnutrition. F. Gómez, R. Ramos-Galván, J. Cravioto, S. Frenk, C. de la Peña, M. E. Moreno, and M. E. Villa.—p. 262.

*Studies on protein metabolism in undernourished infants and children. N. S. Matsaniotis.—p. 267.

Vol. 51, October, 1957

*Urinary calculus disease among Israeli immigrant and Arab children. D. Levy and W. Falk.—p. 404.

*Favism. Case report showing heredofamilial tendency. H. C. Tolmas.—p. 445.

Nitrogen Balance in Infants. Nitrogen balance data on nine healthy infants indicate that nitrogen is slightly better retained from human than from cow's milk. If correction is made for increased urea in human milk, the greater retention of nitrogen during feeding of human milk is of statistical significance. The increased nitrogen retention is apparently the result of better absorption of protein rather than of differences in metabolism of protein. Nitrogen balance studies of short duration may be misleading because of differences not associated with intake and output alone. Certain infants remained in positive nitrogen balance on feedings of 125 mg. nitrogen per kilogram per day, regardless of whether the protein source was human or cow's milk. This indicates that the protein of human and cow's milk is approximately equal in biologic value, and that infants may remain in positive nitrogen balance and grow satisfactorily on feedings of 0.8 gm. protein per kilogram per day. One infant failed to thrive and could not be maintained in positive nitrogen balance except on human milk. The bacterial flora of the intestine, as determined by stool cultures, differs on feeding of human and of dilute cow's milk. A much greater proportion of the *L. bifidus* organisms in the stools of babies fed human milk are of the variety "pennsylvanicus" than are those in the stools of infants fed cow's milk. A biologic effect on the intestinal flora of the crude bifidus factor, as shown by a decrease in stool *p*H, is detectable in infants.

Lactose and Nitrogen Metabolism. Phenolic excretion was measured in five infants fed variations of common

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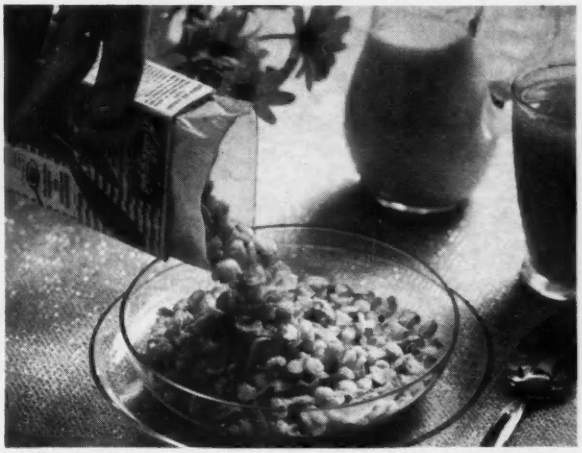

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infant formulas. The main difference in the formulas was in substitution of dextri-maltose for part of the lactose in one feeding mixture. The nitrogen content was the same in type and quantity. Nitrogen retention was greater in the infants fed the lactose-containing formula. These babies tended to excrete more phenols during the feeding of the formula containing dextri-maltose than during feeding periods on the formula containing lactose as the sole carbohydrate. Excretion of phenolic acids was much greater in the infants fed the formula containing dextri-maltose. The range of normal phenolic acid excretion for infants is presented.

Lysine Supplements and Nitrogen Metabolism. Nitrogen balances were done on five male children affected with chronic severe protein malnutrition while on a diet of cow's milk and without L-lysine supplements. Neither the absorption nor the retention of nitrogen from milk was significantly affected by the addition of the supplement. Up to the present it does not seem justified to use these supplements in the treatment of severe cases of protein malnutrition.

Protein Metabolism in Undernourished Children. An attempt was made to study some aspects of protein metabolism in infants and young children suffering from severe undernutrition. Criteria were defined for the differentiation of patients suffering from severe undernutrition due to an inadequate but otherwise well balanced diet and those with protein depletion syndrome (kwashiorkor), third degree malnutrition, hypoproteinosis, and so on. Plasma amino-nitrogen curves were obtained following: (a) the ingestion of whole casein for the study of the proteolytic activity in the gastrointestinal tract, (b) the ingestion of casein hydrolysate for the study of the intestinal absorption of amino acids, and (c) the intravenous administration of casein hydrolysate for the study of the rate of disappearance of amino acids from the blood stream. It is evident that the plasma amino-nitrogen level after casein hydrolysate feeding depends on both intestinal absorption and rate of disappearance of amino acids from the blood stream. The proteolytic activity in the gastrointestinal tract was equally effective in fifteen well nourished and twelve severely undernourished infants and young children. Thus it was suggested that formulas of predigested protein are not necessary in the feeding of undernourished infants. The rate of absorption of amino acids through the intestinal mucosa was equal in fifteen controls and twelve severely undernourished patients. Although the range of individual variations was quite wide, the conclusion that amino acid absorption remains intact in severe undernutrition may safely be drawn. Under the conditions of this experiment no difference was detected in the rate of amino acid assimilation by twelve severely undernourished patients compared with fifteen well nourished infants and children. Such a result was to be expected, since undernourished infants, although exhibiting a chronic reduction of their protein store, do not suffer from acute protein depletion. The multiplicity of the etiologies and pathogeneses of the various types of poor nutrition in infancy and childhood dictates the need for a more and better terminology. Until better-defined criteria are established for the differentiation of the various types of poor nutrition, it is suggested that all clinical, pathologic, and biologic findings derived from such cases be accompanied by detailed description of the patient material instead of being vaguely attributed to "malnutrition."

Urinary Calculus Disease. Thirty-one patients with urolithiasis were admitted to the pediatric department of the Rambam Government Hospital in Haifa between 1949 and the end of 1956. The great majority came from the Yemenite and Eastern Jewry ethnic groups and the Israeli Arab minority. The three non-European ethnic groups in Israel do have in common a poorer nutritional state of their infants and children, whose diets are particularly poor in proteins of animal origin, vitamins, and fats and are rather rich in carbohydrates. These essentials are absent in adequate quantities from the very beginning of their lives because of the insufficient milk of the lactating mothers, who subsist on an inadequate diet. Their condition is further aggravated by the persistence of non-European mothers in breast-feeding for periods long past the first year of life. In these children, the persistent and prolonged poor nutrition could have caused the abnormal conditions within the body in which the various calculogenetic factors can cause the formation of a stone. It is the view of the investigators that the greater frequency of lithiasis among the Yemenite Jewry group, the Eastern Jewry group, and the Arab children is related principally to the deficient food diet. There were only four cases coming from Jewish families originating in Europe, the Ashkenazic ethnic group.

Favism. Favism is caused by the ingestion of *Vicia fava* (also known as the horse bean, fava bean, broad bean) or by the inhalation of pollen from the blossom, by people having an idiosyncrasy or allergy to this substance. Among the relatively few states in which the bean is grown, Louisiana harvests a large crop annually. Only sixteen cases have been reported in the U.S. since 1933 and none were from Louisiana. This is interesting, since there is a large Italian population in that state and it is known that persons of Italian extraction constitute the majority of people who cultivate and eat fava beans in this country. Forty per cent of the cases of favism result from inhalation of pollen and approximately 60 per cent from ingestion of the beans. Males are affected more commonly than females. Most cases occur in childhood and adolescence, though nursing infants are not immune. The incidence of favism is definitely seasonal. The clinical cases are prevalent between April and May, when the plant is flowering, and between June and July, when the mature bean is marketed and eaten. A typical case of favism is reported in a two-and-a-half-year-old child, following ingestion of the fava bean. This patient became ill in April. The typical signs and symptoms of icterus, anemia, fever, irritability, vomiting, weakness, systolic heart murmur, and hemoglobinuria clearly characterize the clinical picture. The patient was given an infusion of 5 per cent dextrose in distilled water, followed by 500 cc. whole blood. Hydrocortisone in doses of 50 mg. every 6 hr. was administered. Ascorbic acid, 300 mg. per day, and 10 mg. vitamin K in divided doses were ordered. The child was discharged three days after admission and has apparently been well since.

THE MEDICAL CLINICS OF NORTH AMERICA

November, 1957

*The gluten-free diet in idiopathic steatorrhoea. J. M. French and C. F. Hawkins.—p. 1585.

Gluten-Free Diet. Gluten in wheat and rye flour is now recognized as the specific etiologic agent for idiopathic steatorrhea and celiac disease. Idiopathic steatorrhea is a disease of adults. A defect in fat absorption and malnutrition are constant. Often a persistent diarrhea leaves the patient prostrate, severely anemic, and vitamin deficient. More than half of the patients have a known history of celiac disease in childhood. The abnormal function of the small intestine is incurable. Many patients regain normal activities with a well planned medical treatment, a correction of the anemia, and a high-protein, low-fat diet. With the aid of a gluten-free diet, amazing results are attained.

NUTRITION

Vol. 11, Autumn, 1957.

*Anaemia and nutrition. S. Davidson and A. P. Meiklejohn.—p. 103.
*Dietetics and digestion. J. Farrell. —p. 108.
*Dietetics in America. 4. Trends and tendencies and further education. M. E. Furnivall and J. G. Ingram. p. 114.
*Dietetics in an obstetric unit. S. P. Gilpin.—p. 117.

Anemia and Nutrition. The discovery of the value of liver in the treatment of pernicious anemia in 1926 acted as a great stimulus to research into the cause and treatment of other forms of anemia. The nutrients—iron, folic acid, and vitamin B_{12}, and protein —are of particular importance for blood formation. Iron deficiency ane-

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mia is at least one thousand times more common than all the other anemias combined. It is felt that only about 10 per cent of the iron in foods is usually absorbed. The intestinal mucosa is the major regulator of iron absorption. Iron deficiency occurs frequently in infants between six and twenty-four months. This is due to an iron-poor diet (usually milk with few or no solid foods) during a period of rapid growth. Women of the childbearing age are also vulnerable to iron deficiency because of the demands of menstruation. Patients who have lost weight from a simple insufficiency of food are often mildly anemic. Macrocytic anemia and nutritional megaloblastic anemia are briefly discussed.

Digestibility of Foods. It is usually assumed that, in the absence of pain, digestion is complete, but this is not necessarily true. Since dietary calculations are based on an assumption of full utilization, undigested residues are of importance. Experiments were done to test the effect of mastication on digestion. One specimen was chewed before being put into its cotton mesh bag and the other specimen not. The bags were sewn together, swallowed and recovered from the feces, usually at the end of 24 hr. The bags were examined to estimate the percentage of undigested residue of each specimen. These results are given in table form. It is concluded that digestibility of food is affected by a number of factors including the type of food, the method of preparation before cooking, the way it is cooked, and the amount of chewing. Lean meats and vegetables are the least digestible foods. Of the meats, pork, bacon, beef, mutton, and liver are less digestible than chicken and lamb. The digestibility of lean meat was greatly increased by beating it with a spiked hammer and using a tenderizing salt containing papain before cooking. Fried meats are more digestible if cooked slowly, but raw meat is even more digestible. Chewing food is the easiest and most effective way of increasing digestibility. There are wide variations in chewing habits, even when the teeth are capable of thorough mastication.

Dietetics in America. This is the last of a series of four articles by two British dietitians concerning dietetics in America as they observed it during their stay here. It seems particularly difficult for British dietitians to perceive what may be the future developments in their field. Trends and tendencies can be seen more easily in America. The present trends are focused on three main topics in this paper: the shortage of dietitians and all hospital personnel; increased cost; and the awareness by the general public of nutrition education.

Dietetics in Obstetrics. Improvement in the diet of pregnant women was responsible for the dramatic reduction of fetal mortality in Britain during the recent war, and there is no reason to think that further improvement is impossible. It is felt that well fed girls have a much better chance than those who are ill fed of becoming healthy mothers and of having uncomplicated pregnancies. A dietitian at an ante-natal clinic describes her method of interview and some of the problems encountered. There is a challenge for the dietitian in an obstetric unit, for the mothers who are being educated in good feeding today are the promoters of the food habits of the next generation.

NUTRITION REVIEWS

Vol. 15, October, 1957

*Changing patterns in nutrition education. E. S. Eppright.—p. 289.

*Chewing your food.—p. 292.

Changing Patterns in Nutrition Education. Nutrition education is in the process of changing from a passive, academically interesting subject, to a dynamic area of learning directed toward the welfare of individuals of future, as well as present generations. Nutrition education is becoming a person-centered or even a society-centered rather than subject-centered area of learning. With the increasing scope of nutrition, the nutrition scientist and the nutrition educator are seldom the same person. The nutrition educator must master his subject and develop skill in using educational tools. Basic principles of learning are emphasized: (a) placing importance on the individual, his background, differences, and goals; (b) considering the learner's own perception of the task to be accomplished; (c) recognizing the importance of human relations in the learning situation; (d) involving the learner; and (e) making wise use of the many materials and resources now available.

Chewing Your Food. The past decade has seen a revival of interest in mastication as it relates to a variety of physiologic conditions. It is suggested that there may be a relation between dental caries and mastication. Dental surveys in Europe during and after World War II attributed reduction of caries to the increased chewing necessitated by coarse foods. However, other workers have found no relation between the hardness of the diet and caries in cotton rats. Another area of interest is the relation existing between mastication and an individual's nutritional status. A study was done in which the subjects swallowed two small cotton bags, one containing chewed food and the other intact food. These experiments showed a much higher percentage of residue from meats for the unchewed food as compared to the chewed food. Other investigators found that even with poor masticatory efficiency, the amount of residue remaining in a bag recovered from the feces was no greater than that from individuals with good masticatory ability. It is concluded that even in an individual with extreme limitations of masticatory efficiency, the undigested residue remaining is negligible.

PUBLIC HEALTH REPORTS

Vol. 72, October 1957.

*Diarrheal disease control by improved human excreta disposal. L. J. McCabe and T. W. Haines.—p. 921.

*An outbreak of gastroenteritis in a Louisiana school. J. D. Martin, R. M. Martine, C. T. Caraway, and J. D. Orgeron.—p. 929.

*Q fever and milk pasteurization.—p. 947.

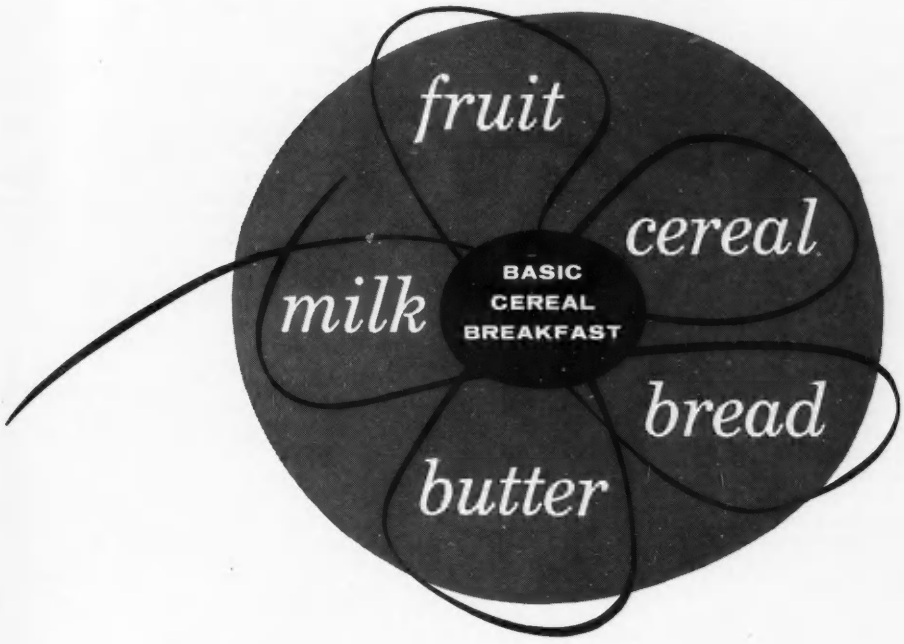
Vol. 72, November, 1957

*Prevalence of four enteropathogenic *E. coli* groups in preschool children. W. T. Cooley and D. J. Schliessmann.—p. 1001.

Improved Sanitation. As long as flies were easy to control with DDT and other insecticides, an effective diarrheal disease control procedure was available, but the development of insecticide-resistant flies necessitated a closer examination of the fly's role in transmitting diarrheal disease. The exclusion of flies from their source of human enteric pathogens should prevent fly transmission of disease as shigellosis. A privy rehabilitation program was conducted in a small town in Georgia. This markedly curtailed housefly breeding in privies, even though the housefly population in the community was not reduced. Epidemiologic observations were continued for eighteen months after the privy remodeling showing a significant reduction of Shigella infections in children less than ten years old. The reported diarrheal disease rate in this town was one-half that observed in the check town.

Outbreak of Gastroenteritis. Over half of the people who had their noon meal in a school cafeteria in Louisiana became ill with gastroenteritis. Presumably, the offending foods were meat loaf and pork and gravy. How these foodstuffs became contaminated and the identity of the infective agent was never established. As the result of the investigation, a list of recommendations are given concerning food handling for public establishments.

Q Fever and Milk Pasteurization. A significant number of human cases of Q fever have occurred in the U. S. in recent years. In certain areas in the West, the disease has been found to be endemic in cattle, goats, and sheep. Contaminated milk from animals infected with *Coxiella burnetii*, the organism of Q fever, is a source of man's infection. Studies have shown that this organism survived the procedures recommended for the pasteurization of milk. Present studies conclude that the minimum recommended standard for the pasteurization of milk of 143°F. for 30 min. is inadequate to eliminate all the viable rickettsiae from cow's milk. Heating milk for 30 min. at 145°F., and heating it for 15 seconds at 161°F. were both adequate. It is recommended that the minimum standards for pasteurization of milk



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The Iowa Breakfast Blood Sugar Studies proved that a basic cereal and milk breakfast providing about 20 gm. mixed plant and animal protein (cereal and milk) provided quick and lasting energy throughout the early and late morning hours. As shown in the table below this morning meal is *low in fat* and provides well-balanced nourishment.

basic cereal low-fat breakfast pattern

Orange juice, fresh, ½ cup,
Cereal, dry weight, 1 oz.,
with whole milk, ½ cup, and sugar, 1 tsp.,
Bread, white, 2 slices, with butter, 1 tsp.,
Milk, nonfat (skim), 1 cup,
black coffee

Nutritive value of basic cereal breakfast pattern

CALORIES	502	VITAMIN A	600 I.U.
PROTEIN	20.5 gm.	THIAMINE	0.46 mg.
FAT	11.6 gm.	RIBOFLAVIN	0.80 mg.
CARBOHYDRATE	80.7 gm.	NIACIN	3.0 mg.
CALCIUM	0.532 gm.	ASCORBIC ACID	65.5 mg.
IRON	2.7 mg.	CHOLESTEROL	32.9 mg.

Note: To further reduce fat and cholesterol use skim milk on cereal which reduces Fat Total to 7.0 gm. and Cholesterol Total to 16.8 mg. Preserves or honey as spread further reduces Fat and Cholesterol.

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be changed to conform with the findings of this study.

***E. Coli* in Preschool Children.** There is limited epidemiologic information on the age-specific prevalence of the enteropathogenic *E. coli* in normal populations, secondary attack rates, duration of carrier state, and case-to-carrier ratio. A six-month survey of the prevalence of Shigella and Salmonella and four enteropathogenic *E. coli* groups in 172 healthy preschool children was conducted in eastern Kentucky in four areas having diverse housing and sanitary facilities. From 1000 cultures, 59 Shigella, 3 Salmonella, and 13 *E. coli* were isolated. Three *E. coli* groups were isolated; the fourth enteropathogenic group was not recovered. None of the 13 children who were positive for *E. coli* gave a history of being ill, and all subsequent monthly cultures were negative. In 28 cultures of siblings of 7 positive children, only one instance of intrafamilial spread was observed. *E. coli* did not contribute appreciably to the diarrheal attack rates in the areas sampled.

SCIENCE

Vol. 126, November 15, 1957

*Role of glycolysis in fatty acid and cholesterol synthesis in normal and diabetic rats. M. D. Siperstein and V. M. Fagan.—p. 1012.

Fatty Acid and Cholesterol Synthesis. It has been repeatedly demonstrated that depressed glucose oxidation, as seen in such conditions as fasting or diabetes, results in marked derangements of fatty acid and cholesterol synthesis. That such disturbances in the synthesis of lipids are secondary to the lack of glycolosis is shown by the fact that reinstitution of carbohydrate metabolism, by whatever means, results in prompt return of lipid synthesis to normal. It is now well established that glucose oxidation can take place by either of two routes, the classical Embden-Meyerhof (EM) pathway or the more recently described hexosemonophosphate (HMP) shunt. It seems possible that the HMP pathway might play a role in the control of cholesterol and fatty acid synthesis out of proportion to its quantitative importance in glycolysis. The present studies were designed to determine which of the two pathways of glucose oxidation is primarily responsible for the influence of glycolysis on lipid synthesis in normal and diabetic animals, and to explain the mechanism by which such effects might occur. It appeared that the glucose oxidized via the HMP shunt is primarily responsible for the effects of glycolsis in enhancing both fatty acid synthesis and cholesterol synthesis in normal liver. It would also follow that, when glucose is being oxidized at an adequate rate, cholesterol synthesis might be controlled by the relative amounts of glucose, that going by the HMP shunt stimulates the process and using the EM pathway depresses it.

SOUTH AFRICAN JOURNAL OF LABORATORY AND CLINICAL MEDICINE

Vol. 3, June, 1957

*Some biochemical changes in kwashiorkor. Z. M. Smit and P. J. Pretorius.—p. 142.

*The influence of pyridoxine on iron absorption in non-pregnant subjects. J. J. Theron and B. J. Meyer.—p. 149.

Biochemical Changes in Kwashiorkor. Changes in the total serum proteins, protein fractions, amylase, cholesterol, ascorbic acid, and carotene of fifty-eight patients suffering from kwashiorkor were studied. They received skim milk without additional vitamins for three to four weeks. The initial low levels of serum proteins, amylase, and cholesterol increased during this period to normal levels in the same manner as reported by others. The normal ascorbic acid and low carotene levels remained more or less stationary. The urine of eleven patients was collected and examined soon after admission. Oliguria and low creatinine-excretion values were usually found. The excretion of urinary thiamine, riboflavin, and N^1-methylnicotinamide were determined in some instances.

Pyridoxine and Iron Absorption. It has been reported previously that the parenteral administration of pyridoxine suppresses the absorption of iron in pregnant Bantu women. It has also been shown that there is a relative deficiency of pyridoxine during pregnancy as revealed by an increased urinary excretion of xanthuremic acid. In the present investigation normal subjects were used. The parenteral administration of pyridoxine had no influence on the absorption of iron in normal non-pregnant women. The explanation for this marked difference of the influence of pyridoxine on iron absorption in pregnant and normal women is not clear. It is suggested that a derangement in protein metabolism caused by a deficiency of pyridoxine may interfere with the synthesis and/or breakdown of the protein-iron acceptor, apoferritin, in the mucosa of the intestine.

SCIENTIFIC MONTHLY

Vol. 85, November, 1957

*How adequate is the world's food supply? R. W. Phillips.—p. 256.

Adequacy of World's Food Supply. The size of the job of daily producing and distributing enough food to feed approximately 2652 million persons can, perhaps, be visualized in terms of the family dinner table. Imagine a table set up around the world on the equator, with 2 ft. allowed per person on each side. To feed all the people at one sitting would require 20 such tables, together with a small auxiliary table 4232 mi. long. Considering the population increase by 1960, 21 tables stretching around the earth at its center, plus an auxiliary table about 18,500 mi. long, would be required. Putting food on the table for well over 2.6 billion people is no small task. The rise in world agricultural production, only slight in 1954-55, was rather more sharp in 1955-56, and the average annual increase over the last five years of 2.6 per cent is about 1 per cent ahead of the annual growth of world population. The main increase in 1955-56 was in the regions most troubled by surpluses. Production rose considerably in North America for the first time since 1952-53, despite acreage limitations in the United States, and there was also a marked rise in Oceania. In the rest of the world the increases were smaller, although the Far East registered its largest gain for some years, and in some regions production declined slightly. Production developments in 1955-56 thus did little to reduce the long-standing inequalities between the well fed and the underfed regions. The problem of finding enough food for all the world's people has been the concern, during the last three decades, not only of agriculturalists, nutritonists, economists, and politicians but, voluntarily or involuntarily, of almost every thinking man and woman. For the world as a whole, many problems of production and distribution, and of economic development generally, remain to be solved before all the people of this generation or the next, or of the generation after that, can be adequately fed.

TEXAS STATE JOURNAL OF MEDICINE

Vol. 53, November, 1957

*Protein nutrition in pregnancy. G. Terry.—p. 829.

*Glutamine in treatment of peptic ulcer. W. Shive, R. N. Snider, B. DuBilier, J. C. Rude, G. E. Clark, Jr., and J. O. Ravel.—p. 840.

Protein Nutrition in Pregnancy. The value of adequate protein, both qualitative and quantitative, in pregnancy is reviewed. It is felt that sufficient protein has some influence in preventing eclampsia and other toxemias, in the health of the infant, and in resistance to infections. The quality of the protein is important, also, especially in lower income groups. If the quantities cannot be increased, it is of prime concern to improve quality. Studies have shown that most proteins, except meat, are deficient in lysine, and that lysine added to the diets of malnourished groups can improve the nutritional status. In this study a dietary supplement containing lysine was administered in a controlled series of patients. Those given the supplement had significantly higher mean levels of hemoglobin throughout pregnancy and, at three days post-partum, did not develop signs of preeclampsia and demonstrated impressive relief of chronic fatigue and increased feeling of well-being. It is felt that the administration of the

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Glutamine and Peptic Ulcers. It has been reported by Cheney that raw cabbage juice contains a heat-labile factor which is effective in treating peptic ulcers. In this study this factor, identified as glutamine, was isolated from cabbage juice. It also was found that juices from different sources of cabbage vary in their content of glutamine. The ability of others to duplicate Cheney's results might be attributed to this variation. In the preliminary study reported here, forty-six of a group of fifty-seven patients were given glutamine at some stage of treatment. The results suggest that glutamine may be useful in peptic ulcer therapy. Glutamine is known to have a role in the biosynthesis of certain mucoproteins and could aid in stimulating mucin synthesis which should benefit peptic ulcer patients.

ADULT EDUCATION

Vol. 8, Autumn, 1957

*Education for adult leadership. C. O. Houle.—p. 3.

Education for Adult Leadership. The philosophy and reason for the strong support and continued strengthening of adult education programs is discussed here. The author believes that society maintains universities in part because it expects them to have a broad range of concern. The university is expected to re-interpret the values of the past and seek new knowledge on which the future will be built. Today universities cannot restrict their educational facilities and programs to the young. Because they possess so much of the talent which society requires, universities must play a more active part in the improvement of the community. One of the best ways by which they can do so is to help those who are mature learn how to fulfill their potentialities, to be creative, and to use their capacity and their initiative in meeting the constant challenge of change.

ADULT LEADERSHIP

Vol. 6, December, 1957

*Learning to solve group communication problems. A. C. Posz and M. J. Wiksell.—p. 149.

Group Communications. A communications course for union factory workers was planned and given by the authors with successful results. The original plan was made well in advance of class meetings with union education committee members participating in the selection of subject and techniques. After studying the information accumulated about the needs and interests of the prospective students, a meeting was called to get opinions on how the course should be given. It was decided almost unanimously that it should deal with the general field of communicative relations with other people. Subject matter would include effective listening; distinguishing fact from opinion; asking and answering questions; giving and receiving criticism; and giving advice. Techniques of teaching included an objective listening test to sharpen consciousness of the need for listening skills; a rumor clinic to sharpen those skills; and, group discussion (using six men per group) of ways to improve communications techniques. In each part of the course, the lecture method was assiduously avoided. Realistic role playing, circular response, and discussion of case studies were used instead. Tests were given to the men and were corrected by each man himself, the object being to sharpen their awareness of their improvement over a period of time. Types of test included: multiple choice, analysis of hypothetical human interest problems, and a follow-up test designed to determine if the students had learned to distinguish between facts and opinions.

AMERICAN RESTAURANT MAGAZINE

Vol. 41, November, 1957

*Restaurant labor and what the restaurant operator can do about it. —p. 24.

*Prime facts on meat. C. E. Blackburne.—p. 52.

*Labor costs cut with pre-cut meats. —p. 59.

Restaurant Labor. If a restaurant operator does not want to be unionized, he should act before the union organizer comes to his employees. To increase employee efficiency and job satisfaction, operators must make more effective use of the individual employees' time. Greater efficiency cuts overhead, and wage increases are then justified on the basis of higher production levels. Careful attention to the initial employment of workers, utilization of well trained, part-time or older workers, proper instruction of employees, profit-sharing, bonuses, and incentive programs, will all contribute to greater employee satisfaction and keep the unions at bay. Security and a sense of belonging are very important in maintaining good employee relations. To belong, an employee must realize his job and his future will utilize his skill and knowledge and that there will be recognition of his ability. Security can be obtained through the benefits of a cooperative health, accident, and benefit plan that covers all employees. In the case of the small firm, benefits of such a policy may be obtained through association with other operators cooperating together to obtain the low insurance rates offered to large groups.

Prime Facts on Meat. Here is a fact-filled article on meat which includes diagrams of carcass bone-structure and location of cuts in dressed beef, lamb, and pork carcass. A general knowledge of the section of an animal from which a cut is obtained is useful because different sections vary widely in tenderness. As a rule, the more tender cuts come from the supporting muscles which lie along the back bone. Less tender cuts come from the working muscles of the legs, shoulder, breast, flank, and shank sections. When ordering, consider that meat with much bone and gristle yields about one to two portions; meat with a medium amount of bone yields about two to three portions. Cuts with little to no bone yield from three to five servings. Also, when ordering, buyers must know grades. Ascertain the grade required from an examination of official government grades and then determine the equivalent brand of the packer. All packers have their equivalents (one well known packer uses "Star" for U.S. Prime.) Buy for individual needs: don't buy half a carcass if you will not get enough of certain cuts used in your operation. Best cuts of veal are legs, breast, and shank with shoulder a close third. Best cuts of pork are hard to determine. With the exception of the fat back, the entire side of pork consists of good food-cost items with almost universal acceptance. Loin and rib are preferred in lamb, but biggest money-makers are neck, shoulder, shank, and breast.

Precut Meats Cut Labor Costs. Advantages of prefabricated meats are manifold. Operators claim they take the guesswork out of portioning and yield accurate portion-cost control. Menu costing is made easy with the use of these trimmed, weighed, ready to cook meats. Menu planning, too, is made simpler. Items that sell at profit are purchased, and there is no worry about leftovers and trimmings. Because many cuts, in fact most, are packed in 10-lb. boxes with full information as to contents printed on the container, prefabricated cuts tighten inventory controls. Almost any type of meat or cut is available in fabricated form, including: pork, beef, and veal chopettes, sandwich steaks, pork and beef patties, sliced beef liver, lamb loin chops, and other cuts of lamb as well as such steaks as beef tenderloin, aged boneless strips, T-bones, sirloin, butts, beef loin, boneless rib-eyes, steaks for Swissing, and other varieties.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 23, November, 1957

*How great is the growth in college food service.—p. 52.

Growth in College Food Service. Today more than half of the nation's college students are fed on campus. Five years ago only a third were eating on campus. The trend toward expanded facilities is also indicated in these statistics: 96 per cent of reporting colleges reveal increased use of frozen foods, the median in-

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crease being 27 per cent. Colleges and universities are using 50 per cent more frozen baked goods than in 1952, 40 per cent more frozen juices, and 25 per cent more frozen fruits. A big increase in snack bars was revealed. Fewer than 800 of these installations were noted in 1952; today 1900 are operating with a seating capacity of 5,000 at counters and about 100,000 seats at tables. These snack bars offer items found in the usual soda bar and about half offer hot plates. It was reported that 70 per cent of the colleges use cafeteria service exclusively at lunch. Table service at dinner is available in about 26 per cent of the reporting colleges. The article gives an accounting of types of equipment in use.

DINER DRIVE-IN

Vol. 16, November, 1957

*Training with pictures. D. E. Lundberg.—p. 34.

*Cooking with dried foods. O. Hanson.—p. 53.

Training Pictures. When it comes to training restaurant employees, a picture can save a great deal of the manager's time and energy. A job breakdown in pictures also helps the manager remember all parts of the instruction. Pictures, 8 by 10 in., of each step of the operation should be put in plastic and inserted in a loose-leaf notebook. They will be well protected and on hand so that they can be used when new employees are interviewed.

Cooking with Dried Foods. To avoid off tastes in reconstituted dry milk, dry eggs, and other dried foods including coffee, distilled water should be used. Distilled water can easily and inexpensively be produced in your own establishment by using a large stock pot or an old-fashioned wash boiler with a rack on the bottom. A large crock is placed in the center of the rack. Place the cover of the pot upsidedown on the pot and bring the water to a boil. The steam will condense on the cover and drip into the crock. For faster condensing, place a cold damp cloth on the cover and change the cloth when it gets warm. The author is convinced that distilled water will become a must in the future when more and more dried foods will be used.

FOOD ENGINEERING

Vol. 29, November, 1957

*Thermoformed plastics add new food-packaging values.—p. 74.

Plastic Packaging. Some of the packaging ideas already in commercial use and others just around the corner include: plastic "cans" with heat-sealed lids; squeezable tubes, "cans," and bottles; clear trays for meat, poultry, and frozen foods; unbreakable tumblers flecked with sparkling metals; decorative cups for one-unit servings; plastic aerosols; combination packages utilizing plastic for closures and windows; and practical reusable plastic containers. Polyethylene is picked as a front runner for rigid and semirigid package application. Styrene also promises to be a big food field performer. Cellulosics should increase their role as a result of approval of plasticizers by the Food and Drug Administration and the development of machines for high-speed economical forming, filling, and sealing of small cups and blisters. And, although acrylics and thermosetting plastics, such as phenolics, ureas, and melamine are, as yet, too expensive for general container use, they will continue to be used for closures and may find application in luxury packages. Stepped up research in all forms of plastic packaging means there will be an ever-widening choice of shapes and materials to solve packaging problems.

FOOD SERVICE MAGAZINE

Vol. 19, November, 1957

*Revolution in refrigeration. J. R. Norris.—p. 32.

*Cooking fresh vegetables. A. S. Day.—p. 34.

*Meat roasting 1957 style. N. Grey.—p. 37.

Revolution in Refrigeration. The refrigerator is no longer the big cold box that takes up valuable space in the storage area. Today, it can be located anywhere—where it best suits the operation, where it is most needed in the work area. This is accomplished by the use of five different types of modern refrigeration: the walk-in with adjustable shelves that allow for increased capacity; the pass-through with doors on either side that enable you to reach any item inside; the reach-in with trays, pans, and mobile shelves designed for stock-piling of items; the drawer-type where you can file items by stacking; the under-counter-type that allows you to get items needed without leaving the work area. These five types of refrigeration can help considerably in narrowing the gap between supply and demand. When peak periods of customer orders tax the supply, the refrigerator is at hand with prepared items and items ready for immediate preparation.

Cooking Fresh Vegetables. New types of electrical cooking equipment now make small batch cookery of fresh vegetables so practical that no operator need cook them otherwise. It has long been known that cooking in small quantities is one of the most effective ways of improving fresh vegetable service. Here is how it is done: (a) Fix definite responsibility for the vegetable service on one person. (b) Before refrigeration, divide the entire day's needs of vegetables into small amounts, each equal to the needs of a single cooking batch. (c) Keep an even flow of fresh batches by making a general rule to start another batch when the hot food tray table is half empty. (d) Cook vegetables only until crisp-tender. (e) Avoid mixing batches at the steam-table. No special equipment is mandatory when cooking in small batches, but certain types of cookers have been developed which make vegetable cookery faster, easier, and foolproof. The 1-qt. or 4-gal. steam-jacketed kettle and the various new types of electrically operated steam pressure cookers are the most popular of these.

Meat Roasting. Precut meat and electrical roast ovens have teamed up to save every operator money. Precut meats eliminate losses from overstocking and carryover because they store in a freezer and cannot shrink or spoil. After the roast is prepared for the oven, electricity takes over and, with precision-controlled heat, makes a huge reduction in meat shrinkage. That is why this team—precut portioned meat and the completely automatic electric oven—are hailed by the industry as time-savers, labor-savers, and money-savers.

HOSPITAL MANAGEMENT

Vol. 84, December, 1957

*Merry Christmas. H. M. Albert.—p. 90.

Christmas Decorations. During the the holidays, Christmas trees made of green construction paper and hung with decorated Christmas cookies make a nice addition between beds in hospital wards. The trees can be assembled days before the holidays by the dietary staff during slack periods or by the ladies auxiliary at their weekly or monthly meetings. A recipe for the spicy nut cookies used on the tree is given, as well as complete instructions for assembling.

THE HOTEL MONTHLY

Vol. 65, December, 1957

*How to spice up your profits.—p. 45.

*Special party menus include a decorative motif. F. C. Finch.—p. 51.

Spices. The hotel kitchen is offered an average of twenty-five different spices in 1- and 6-lb. containers today. Another two dozen or so spices are available in the traditional 2- and 4-oz. containers. Among the newest seasoning products are the many blends that spice companies are developing at a rapid rate. The idea, of course, behind the spice blend, is to save time and work, and the general blends as well as specific combinations to be used with spaghetti sauce, shrimp, barbecue dishes, and so on have been very helpful in this way. When a spice blend is found that suits the needs of a dish which the kitchen frequently makes, it may be well worth adopting it. Dehydrated garlic and onion products are also time-savers. Spice experts recommend buying only top grade spices from a reputable supplier and that products be purchased in quantities large enough to fill short-term needs but never so large that stocks remain in the kitchen for more than a few months. One-quarter tsp. spice to 1

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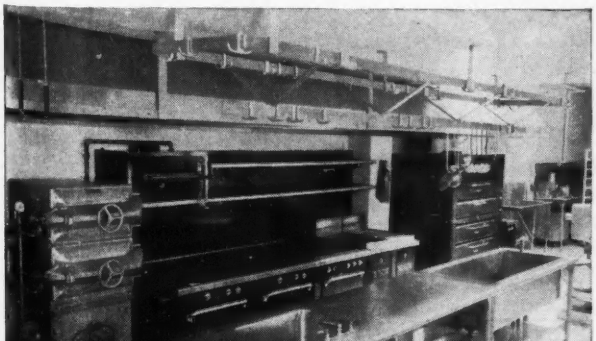

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lb. meat or 1 pt. liquid is a rule-of-thumb measure for seasoning foods. A hotel chef's spice chart showing the correct usage of twenty-eight different spices is given.

Table Decorations. Originality plays a great part in banquet table or ballroom decorating. Decorative material is obtained through hobby shops and stores specializing in window-dressing materials. Some of the most versatile materials used for such decorations include: styrofoam which can be sprayed any color and cut into any shape desired; flashlight bulbs, paint, tulle, pipe cleaners, sequins, and baubles. These in the hands of a creative person can become charming and attention-getting centerpieces at any hotel affair.

INPLANT FOOD MANAGEMENT

Vol. 4, November, 1957

*Planning the inplant cafeteria—personnel. E. V. Nemec.—p. 58.

Personnel. Customer satisfaction in the inplant cafeteria requires well trained personnel who enjoy working with and for people. To have a smoothly working operation, the restaurant or cafeteria supervisor must be a bug on detail. He must have the patience required to instruct over and over again. Above all, he needs the ability to transmit a feeling of group identity to produce team work that results in a feeling of pride and accomplishment after a big day, and a desire on the part of employees to please the customer. Some of the ways these things can be accomplished depend on original hiring and training techniques as well as subsequent supervision. With labor costs constantly plaguing the manager, some thought and effort must go into raising the efficiency level of each employee—although admittedly reduction of cost through increased efficiency is the hardest type of savings to obtain. However, time studies of repetitive tasks, such as portioning meat, can raise the performance of slow workers. Each operation in the cafeteria should be rated for skill and efficiency demanded from the worker in performance. The kind of employees to be selected for these rated jobs should then be determined—cook or chef; men or women; professional or non-professional, part-time help—and fitted to each job. Decisions on techniques, such as whether to buy prepeeled potatoes or not, depend on cost measurements and again, on the type of labor used. The size of the operation will also greatly determine the type of worker needed; the smaller the cafeteria, the more versatile the employees will have to be. Successful hiring also depends on facts. To this end, complete work histories and in some cases psychologic tests are needed from applicants. Training should be started in the employment interview; the work place should be shown to the applicant and all rules of the company explained. Hire for simple jobs and promote from within the ranks. The supervisor cannot afford to drop training after the initial adjustment of the new employee. The acquisition of poor work habits or techniques that are not furthering the operation are bound to appear and should be detected and corrected. A case in point is a simple operation such as putting butter pats on butter chips. When two or more employees do this job at the same time, a social party is automatically created. Such a disruptive gathering can be broken-up by directing all but one worker to other tasks.

INSTITUTIONAL FEEDING AND HOUSING

Vol. 9, November, 1957

*Pears and cauliflower are plentiful now. R. A. Seelig.—p. 14.
*Stringless green beans are packed four ways.—p. 32.
*Safeguarding the health of America's millions. J. D. Faulkner.—p. 52.
*Built-in cleanliness keeps costs down. W. F. Snyder.—p. 58.
*Keeping stainless looking like new.—p. 60.
*What will it cost to keep it clean?—p. 62.
*Engineered equipment layouts solve basic sanitation problems. C. E. Boardman.—p. 72.
*Sanitation-conditioned prefabricated foods.—p. 76.
*How to evaluate single-service vs. bulk packaging.—p. 78.
*You can cut floor maintenance costs by reducing labor time, upping efficiency.—p. 86.
*Check your dishwashing procedures.—p. 100.
*Clean flatware requires know-how.—p. 104.
*Pots and pans: make sure you're getting them clean.—p. 106.
*Food waste disposal: streamline your handling methods.—p. 108.
*Pest control: Haddon Hall beats a problem.—p. 114.

Vol. 9, December, 1957

*Equipping your buffet table. E. C. Blair.—p. 10.
*Sauces make sense.—p. 14.
*Dishware.—p. 36.
*New food handling method cuts premise feeding costs.—p. 60.

Pears and Cauliflower. Pears ripen best off the tree. Picked at the mature green stage, they ripen at moderate room temperatures within a few days. Winter grades are: U.S. Extra No. 1 and U.S. Combination (at least 50 per cent U.S. No. 1 and the remainder No. 2). Varieties available at different times of the year are: Bartlett, available from mid-July to mid-October; Anjou, available from October to May; Bosc, available from September through January; and the Winter Nelis and Comice. The Hardy is a fall pear, available into November. Ripen winter pears this way: place boxed fruit in a warm part of the storeroom at 60° to 70°F.; cover with wet sacks and keep sacks moist; inspect fruit daily, and chill fruit when ripe. Fruit is ripe when it yields to gentle pressure at the stem end or when it tastes ripe . . . Fine quality in cauliflower is indicated by a white or cream-white, clean, heavy, firm, compact curd with the jacket or outer leaves fresh, crisp, and green. A compact curd has closely united clusters. There is only one U.S. standard grade, No. 1, which requires that the vegetable be compact, free of discoloration, dirt, foreign matter, bruises, and so on and at least 4 in. in diameter. Store cauliflower under wet-cold conditions.

Canned Stringless Beans. Four packs are available for the stringless Blue Lake green bean: whole, whole vertical, French style, and cut. The whole pack contains whole beans not in uniform position in the can. This pack is often called "jumbo whole." In whole vertical pack, the beans are neatly packed and stand vertical to the sides of the can. French-style beans are sliced lengthwise and packed "jumbo" fashion. These beans are also known as French-sliced or julienne. Cut beans come in standard lengths, generally 1½ in. Blue Lake beans are available in 8-oz., and No. 1 picnic, 2, 10, and 303 cans. The beans have a heavy, meaty pod with a small seed. Since there is no air space between the seed and the pod, the bean is never tough.

Safeguarding Health. The prevention of food-borne disease is a joint responsibility of official and non-official agencies and the food industry. The activities of the Public Health Service depend on the cooperation of national public health and sanitation organizations and industry in the development of detailed sanitary standards for specific items of food equipment, and on the voluntary acceptance of health and sanitary regulations by states and communities. The major activities of the Public Health Service include: (a) development of suggested standards, procedures, and other guides for use of states and municipalities; (b) conduct of research and investigations; (c) provision of technical and consultative assistance to states, communities, and industry; (d) provisions of educational and training opportunities; (e) development of sanitary designs and construction criteria for dairy, food service, and baking equipment; and (f) conduct of cooperative state public health programs for the certification of interstate milk and shellfish shippers. Education of food workers to the hazards of food contamination is believed to be of prime importance by the Public Health Service.

Cleanliness Cuts Costs. Sanitation standards for food equipment are based on a few basic sanitation principles. Materials must be easy to clean, as well as chip-, crack-, and buckle-proof and non-toxic. The elimination of cracks, crevices, and hard-to-clean seams and of channels and enclosed spaces in which insects find harborage is the second principle. Parts must be removable without the use of tools

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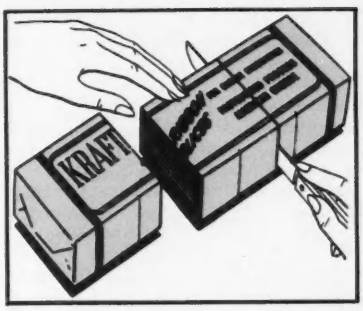

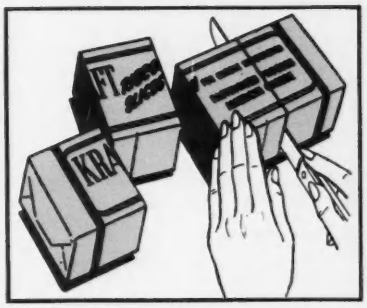

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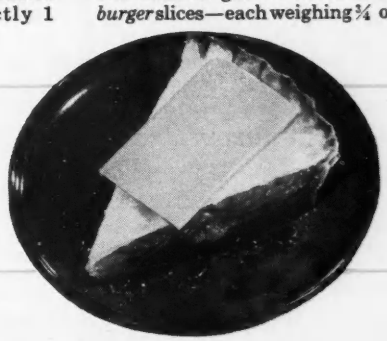

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●

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for cleaning and servicing. National Sanitation Foundation Standards also recommend that height of equipment be at least 6 in. above floor level to facilitate cleaning. Food protection devices, such as sneeze guards, are required for cafeteria counters and units in which foods should be protected from customer exposure. Successful volume feeders believe that in addition to inducing good public relations, modern equipment designed to do specific jobs saves time and labor costs and results in safer, more rapid meal preparation. The National Sanitation Foundation seal on equipment lets operators know that built-in sanitation features have been incorporated into the design.

Guard Stainless Steel. Contact corrosion is the most common cause of pitting in stainless steel. Pitting will appear whenever a semi-solid or solid substance adheres to, or lies against a stainless steel surface for an extended time. Contact and crevice corrosion tend to spread if not checked. Regular and efficient cleaning with the correct agent will prevent this type of attack. A few chemicals will cause serious damage on stainless steel. These include the halogen compounds (iodine, fluorine, chlorine, and bromine) and sulphur compounds (egg yolk, mayonnaise, and sulphuric acid.) Neglected deposits of butter, cheese, and ice cream can cause chemical corrosion, as can stray electric current (particluarly D-C). Current corrosion often occurs where electric equipment is not properly grounded.

Cost of Cleanliness. Stainless steel equipment must be designed and installed with cleanability and other maintenance factors in mind or the equipment will become an expense problem. General improvement in sanitary design and installation can be achieved if operators understand the basic concepts of sanitation and insist that sanitary features be available in all new equipment. There are three basic requirements in sanitary design and installation: (a) resistance to corrosion, wear, denting, buckling, chipping, and crazing; (b) accessibility for cleaning; and (c) easy cleanability. The details of design, construction, and installation often make the difference between profitable and troublesome equipment.

Engineered Layouts. A well engineered layout keeps movement of food supplies and personnel to an absolute minimum and coordinates equipment by departmentalization. By restricting work patterns within limited areas, the operator can go far in eliminating hidden labor costs and he can create greater sanitary safeguards by departmentalizing. Specifically, departmentalization establishes local-area sanitary responsibilities with specific people and minimizes the policing necessary in the over-all sanitation of the food service. The arrangement of equipment in the layout is of prime importance to the operator. Basic principles of installation demand that equipment be either tightly joined or sealed to floor or wall surface; otherwise there must be sufficient room to clean around and under the installation. Mobility is another important concept. Cleaning is made easier if the equipment that is not used often is mobile and can be stored.

Sanitation and Prefabricated Foods. The less food is handled, the less is the possibility of contamination. Prefabricated foods, therefore, can advantageously bring a higher level of sanitation to food operations. Large-scale food handling at a processing plant can be accomplished under easier-to-control conditions than the same operation undertaken in the kitchen. Prepared foods also come into the kitchen clean and packaged. And, in addition to their extra sanitation qualities, they cut time and labor costs. Processed foods distributed in sterile containers should not be transferred to other containers once they have been opened. Original containers are more nearly sterile than containers handled in the kitchen.

Single-Service and Bulk Packaging. Single-service packaging requires no handling or repacking and eliminates any direct contact with the food by persons other than the consumer. Prewrapped individual packages may help to overcome storage problems, serving problems, or cleaning difficulties. Condiments, milk, cream, cereals, jams, and jellies all adapt themselves to individual prepackaging and are widely approved by the public. Foods, such as individual cans of soups, beans, and spaghetti, hot chocolate envelopes, and wrapped sugar cubes, have already demonstrated the sanitary advantages of prepackaged goods.

Floor Care. To reduce floor cleaning costs, you must reduce labor time. This can be done by using job measurement plans and procedures, daily and periodic work schedules, training programs, and proper equipment. You need to time floor operations many times to get correct average minutes for each step of the operation. Then compare averages with the "Standard Job Time List" published with this article. After doing this, determine a fair work load for each employee and post check-off lists for job steps on bulletin boards. Proper training and use of good equipment should further reduce costs. Determine what the best equipment is by performance, not by price.

How to Check Dishwashing. Fundamentals that should be incorporated into every dishwashing operation include correct transporting, scraping, and racking of dishes. To transport from serving area to kitchen, use tote boxes, dish carts, or belt conveyors. To scrape food waste efficiently, use pre-rinse assemblies, waste cans, mechanical disposers, or waste drains. Pre-flushing eliminates rewashing. Racking, sorting, and loading machines should be checked for spacing —each dish must be exposed to wash and rinse sprays. Washing, sanitizing,

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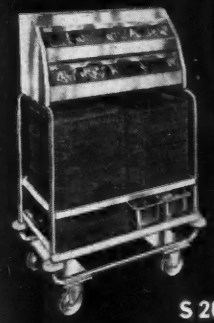

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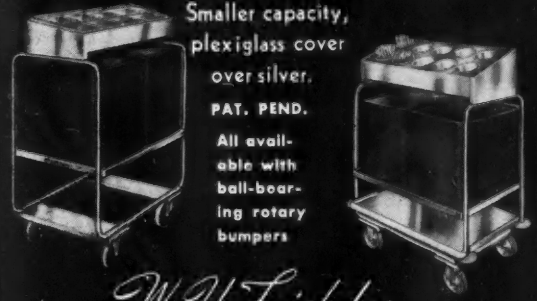

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and equipment care should also be checked. Be sure the wash water has adequate volume, working pressure, temperature, and conditioning. Detergents should be of correct type and concentration for the hardness of the water. Keep the amount of detergent constant—use an automatic dispenser to eliminate waste. Check rinse water for volume, flow, temperature, pressure, timing, wetting additives and any necessary water conditioning. Be sure the machine is the right size for loads and that for draining and drying, adequate ventilation, rack space, and time are provided. Equipment care and sanitizing are easier if an instruction card is posted at a place convenient to the machine and operator. Use proper tools and follow the cleaning schedule rigidly.

How to Clean Flatwear. Presoak silverware to soften soil, and use a detergent in the soak. Use a silverware washing machine if possible. If using a dishwashing machine, scatter the silverware loosely in a regular rack. Don't stack or overload. When using compartmented baskets, be sure to put silverware in with the handles down. Hand washing requires presoaking and the use of a brush plus thorough rinsing. Special rinse-dry solutions dry silverware quickly and spot free and can be used in a dip tank. Another quick dip process will sanitize and assure extra cleanliness. Detarnishing silverplate should be done periodically with a special solution or with three handfuls of table salt added to an aluminum pan with very hot water. Use a burnishing machine to polish, remove scratches, and restore luster to silverware.

Cleaning Pots and Pans. If washing is done by hand, the sink should have compartments for soaking, washing, and rinse-sanitizing. Soak compartments should be large enough to contain all pots soiled after the main preparation period. The sink should have a drainboard large enough to permit proper drainage of clean pots and pans while drying. Each sink needs an overflow pipe to get rid of grease which normally forms on the water surface. Good quality fiber brushes should be used for normal scrubbing and wire brushes for cutting burnt-on food. Good lighting in the cleaning area is essential. Soak and wash water should be kept as hot as the hands can stand. Rinse water should be 180°F. if heat is used to sanitize. Make sure the detergent used has a *p*H factor less than 10, and always determine the exact amount of detergent needed by measuring and marking the sink capacity. Store clean pots and pans in an inverted position on slatted shelves. Mechanical aids to pot-and-pan washing are available: the pump-action pot-washing pump which is attached to the wash compartment can speed the pot-washing operation; electrically driven, revolving brushes connected to a motor by means of a flexible shaft are also available to speed scrubbing time.

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Waste-Handling. With mechanical disposers, two systems of waste-handling can be used, the point of origin or the central station. These disposer systems eliminate waste by breaking it into small particles with whirling or crushing blades and flushing the particles into the sewer. Installation can be made only where local sewerage codes permit. Where sewer systems cannot handle garbage, moisture extraction is a good answer. This mechanism reduces waste to a moist pulp, free of odor. The pulp can be left uncovered without refrigeration for several days and is so compact that food waste normally requiring three cans, fills only one after processing. The unit consists of a grinder, moisture extractor, and pump for recirculation of water. It can handle all food waste plus paper and cardboard and is adaptable to a point-of-origin or central station set-up. With refrigeration methods, conventional walk-in refrigerators are normally used. These refrigerators must have steel door jambs and the inner walls should be covered with galvanized iron or have a bumper rail around the inside for heavy can protection. The floors should be of cement, quarry tile, or other moisture-proof material. Floors should also be flush with the kitchen floor so that garbage-can trucks can be rolled in. Garbage-can washing facilities should be located near by, as should storage space for clean cans. Refrigerator temperatures should be kept at 35°F. and no higher than 40°F. Locate the walk-in near the loading dock and make it a pass-through with doors opening onto the loading platform and the kitchen.

Pest Control. Pest control is 80 per cent preventive sanitation. To eliminate the breeding places of pests, clean the kitchen with steam. Steam and water can clean places impossible to reach with mop or hand. With steam cleaning, all moisture is picked up by a wet-and-dry vacuum machine. Learn to recognize fly larvae and harborages. And, learn the most efficient use of equipment and cleaning procedures. Remove unused equipment and raise equipment off the floor to permit cleaning beneath it where possible. Seal openings between equipment where feasible. When buying new equipment, limit purchases to pieces designed for installation on the floor. See that screens are in repair and secure. All entries to the kitchen should be tightly fitted and the surrounding environment—alley, back yard, and so on—sprayed with DDT insecticide every day. Spray a harmless insecticide around the kitchen each night and use small spray bombs when necessary during the day. Institute an inspection program; every month check the measures taken against pests.

Buffet Service. Trays and bowls in various sizes and shapes meet the basic equipment needs of almost any buffet set-up, even where hot foods are being served. Regular dining tables lined up in a row or, longer tables placed end to end make a good buffet base. For a full smorgasbord arrangement, tables may be arranged in three units—one for hors d'oeuvres, another for salads, cold meats and hot dishes, and the third for desserts, cheeses, and fruits. A whole buffet theme can be planned around a custom-built serving unit such as an electrically revolving lazy Susan. Hot food should be served from chafing dishes, hot plates, portable steam tables, marmites, and steam-warming equipment. During serving replace containers frequently and never let the trays get more than three-fourths empty. To achieve a harmonious setting, you can limit bowls and trays to one material and then provide for variation by taking advantage of different shapes and sizes. Portable ice pans designed to keep foods cool, crisp, and fresh-looking are on the market; or a double bowl filled with ice will perform the same service. For added interest arrange for uneven table heights.

Sauces. There are two foundation sauces, white and brown. For white sauces, stock from veal, chicken, or fish is used. Milk or a combination of milk and stock is also used in some white sauce recipes. Brown sauces have brown stock as their base. The two foundation sauces have variations that are produced by the addition of a roux—a mixture of equal parts of fat and flour heated together to be used to thicken the stock. There are three roux: white, blond, and brown and according to the degree that the flour is allowed to "roast" during heating, these produce white sauce, blond sauce, or brown sauce, when added to the foundation sauces. The addition of egg yolk and oil or butter produce the mayonnaises. Seasoned butter provides the butter sauces. Beyond these basics are the barbecue sauces comprised of various heavily seasoned sauces, usually with vinegar; and miscellaneous sauces, including tomato and fruit sauces. Sauces should be thick enough and with sufficient "body" to coat the food but not thick and pasty. Recipes for eight delicious sauces are given with this article.

Dishware. In choosing dishware, consider these facts. Durability of china depends on its thickness; melamine, a thermosetting plastic has excellent resistance to breakage but scratches easily; and, glass dishware has a highly impervious surface and lower breakage point than china. It has been shown that the best colors for food flattery and decor harmony are those on the pastel side—turquoise, pink, earth tones, and gray. Sturdiness has been added to china plates by the introduction of "rolled rims." New design ideas in melamine ware include notches in the base rims to eliminate water traps in dishwashing, improved dies that have made possible greater density of the finished material. Attempts are being made to reduce the weight of china, but it still remains the heaviest of the dishwares. Mela-

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Filling per pie:
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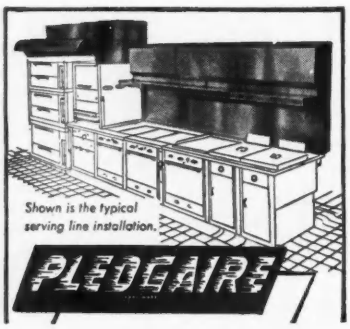

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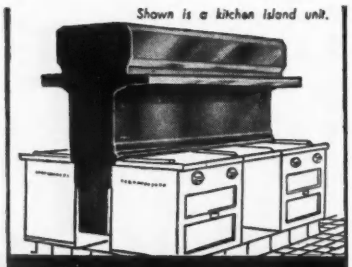

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mine is two-thirds lighter than china and glass dinnerware weighs about the same as china. China survives washing best, however, as melamine becomes stained more easily. Dipping melamine into a sodium perborate base will remove stains, but this is an added operation. A dishwashing machine detergent especially developed for melamine aids in keeping this type of dishware shining clean. Care in bussing methods, racking, washing, and storage must be taken with glass dishware as with china. Glass comes completely clean with normal dishwashing methods and shows a remarkably low bacteria count.

New Food Handling Method. A new preparation system for school lunches has proved successful in a Washington State school district. Food for youngsters is prepared in a central kitchen equipped with a mechanized belt assembly line and manned by ten part-time helpers plus manager, cook, and baker. Food is prepared in the normal manner, except that before the cooked items are finished they are placed in aluminum casserole containers. Canned or frozen items are added without preliminary preparation if possible. Cold food items are assembled on pieces of transparent film. When they reach the end of the belt, the material is folded over and heat sealed. Casseroles and cold-packs are refrigerated until orders from the schools are received by 9:30 A.M. The lunches are then transported by truck in wire racks in multiples of eight to the schools where they are kept until the casseroles and hot dishes are ready to be cooked. In 25 to 30 min., the hot food is ready and is served to the children on top of the cold pack which they use as a tray. The dishes and tray are, of course, throwaways, and there is no fuss or muss in cleaning up. The system has had wide acceptability because portion control assures adequate nutrition for the varying age groups; food is completely sanitary; children like individual packages; and great savings have resulted.

INSTITUTIONS

Vol. 41, December, 1957

*Let conveyors carry the load. Part I. Mobility: The route to efficiency.—p. 6.

*Safety for institutions. How to organize a practical safety program. E. F. Ahern.—p. 8.

*Do too few cooks spoil your broth? M. Johnson.—p. 10.

*Sanitation for food service workers. T. M. Richardson.—p. 32.

*Planning for banquets. S. M. Hartt. —p. 113.

Conveyors. In recent years there has been an increasing trend toward use of simple belt conveyors in single-level operations. The simplest conveyor is the gravity unit of the roller or skate-wheel type. This type can be used in conjunction with a short section of belt conveyor to provide passage through the conveyor, or may be used as an angle turn in a belt conveyor. The gravity conveyor must slope considerably, and when used for a long length, is impractical. Belt conveyors do not have any length limitation, but they do have other drawbacks which must be considered. The belt unit must extend continuously from point of loading to point of take-off, and while it is possible to break up a belt into sections or insert a section of gravity conveyor between two belts, this always is inconvenient and should definitely be avoided. Belt conveyors are available in galvanized iron or stainless steel construction and can be set to travel at any predetermined speed. Vertical conveyors are particularly valuable in buildings where ground floor space is at a premium, or where more than one floor is to be served. The vertical conveyor, used in conjunction with a belt, is frequently a good means of supplying food from a kitchen on one floor to a cafeteria or serving counter on another. Where the vertical conveyor carries hot food, ventilation and air conditioning systems must be balanced to prevent any chilling up-drafts. Other types of conveyors which are sometimes used in food service establishments include the live-roller conveyor, the suspended carriage unit on a continuous roller chain, and a conveyor that, like the belt, runs horizontally. This unusual conveyor accommodates trays, which are pushed horizontally onto rods by pins that are attached to a continuous chain and can actually be installed to travel around corners.

Practical Safety Program. A successful safety program must have the endorsement of top management, and it can cut accident rates only if a thorough selling job is done by this top group. Organization of an effective program begins with the appointment of a safety director whose duties should include the maintenance of accurate records of all acidents and all related facts; periodic inspections accompanied by the insurance company safety engineer or the internal safety committee; and, the education and training of supervisors and workers in safety consciousness. Records on accident prevention must begin with facts. Report forms should be devised to include the name of the injured worker, description of the accident, nature of the injury, and the time and place of the accident in addition to the date the injured employee returned to work. Lost time should be computed from absenteeism figures resulting directly from the accident as shown on the original report. The totals of such lost time for all employees is a good measure of the success of the program. Analysis should be made of the frequency and kinds of accident-injuries to discover the pattern of unsafe acts and/or conditions that need correcting. Accident records should also be coordinated with employment and personnel records to detect the possible presence of "accident prone" employees. Related facts, such as indi-

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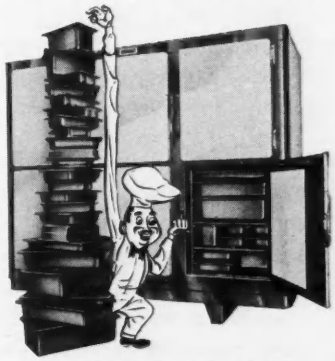

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vidual accident medical costs, worker compensation, and so on, should be determined and total cost of individual accidents computed. As a major part of the program, safety inspection committees should be organized to supplement the daily inspection of premises by on-the-job supervisors in their own particular work areas. A once-a-month formal inspection should be made of the entire premises. This article is accompanied by an accident check-list.

Scarcity of Cooks. If a scarcity of cooks can turn your operation into a maddening day, then consider the modern facts of life that ease absenteeism and allow you to handle heavy business smoothly in spite of short help. A list of these labor-savers would no doubt include fruit juice concentrates, peeled and ready-cut potatoes, dehydrated potatoes for mashing, prepared baking mixes, prefabricated and preportioned meats, frozen and prepared fruits and vegetables, soup bases, dehydrated mixes, and canned broth. In addition, there are many new products keyed to quick service with a minimum of labor. Outstanding among these are: frozen waffles, turkey slices and giblet gravy packed in individual transparent envelopes, dehydrated creamed dried beef, potato pancakes, and prepared pizza bases and sauces.

Sanitation. Here is a run-down on known food-poisoning outbreaks that have occurred in food service establishments across the nation in the past few years. A random selection of incidents shows serious outbreaks as a result of contamination of a number of foods—from meringue pie to dressing. Although unrefrigerated poultry and pastry and other perishables were responsible in some cases, tracing revealed food workers to be responsible for most poisoning outbreaks. It was pointed out that food poisoning can ruin an establishment through publicity and cause great financial loss through damage suits. Under the circumstances it is imperative, says the author, that food service workers be educated thoroughly in proper sanitation.

Banquet Planning. This article introduces the subject of successful, planned banquet management. The author considers banquet service to be service for individual groups on special occasions in situations where the service is provided by a resident staff in the building or where an outside staff is employed to go out from a base of operation and either prepare or serve the food, or both. Service for banquets may either be indoors or outside, at hotels, clubs, or for other groups larger than a family group. It was reported that banquet service in the U.S. is very large with some of the large hotels serving as many as 5000 persons at one event. In keeping with bigness, accepted big business methods are used in planning artistic aspects of the food and service for a banquet.

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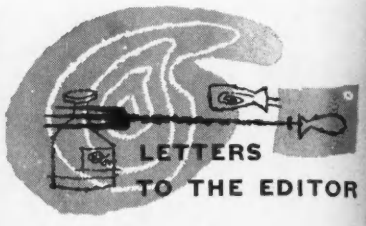

TO THE EDITOR:

It is fortunate that Dr. E. W. McHenry's *Basic Nutrition* (Philadelphia: J. B. Lippincott Company, 1957) became available at the beginning of the school year, inasmuch as many nutrition classes in colleges, universities, and schools of nursing will find it useful. Dr. McHenry brings to the task of writing a text on nutrition a wide experience in research and in teaching graduate and undergraduate students. This might account for the forthright, lucid style and the scope of the brief text which includes non-technical explanations of current technical aspects of the complex subject of nutrition. Although the author assumes that the reader will have had at least elementary courses in biochemistry and physiology, the skillful presentation provides a context for such (possibly) unfamiliar terms as "co-enzymes," "transaminases," "lipotropic," and "Kreb's cycle," so that the meaning is intelligible but the less well prepared student will also be stimulated to extend his knowledge by further reading in the lists of references.

The book is perhaps unique among elementary texts for conveying the questioning spirit characteristic of research, in such ways as suggesting more than one possible explanation for observed phenomena and even in introducing the author's own skepticism of some nutritional tenets widely accepted. This text may well be some students' first encounter with so non-dogmatic a presentation of nutrition.

The contents of the book include a consideration not only of protein, carbohydrate, fat, nutritive elements, and vitamins, but also subjects less frequently found in elementary texts, such as hunger and appetite, the basis for special and therapeutic diets, microbiologic studies, and the controversial subjects, evaluation of nutritional status and prevention of malnutrition. There is a useful table of food composition in average servings; citation of its source, inadvertently omitted as a footnote, is found on pages 247 and 248.

Dr. McHenry is Professor of Public Health Nutrition in the School of Hygiene at the University of Toronto. His other activities, past and present, listed by the publishers include membership in many national and professional nutrition organizations in Canada and the U.S. in which he has served variously as officer, committee chairman, consultant, correspondent, and editor.—*Helen T. Parsons, Ph.D., Professor Emeritus, University of Wisconsin, Madison.*

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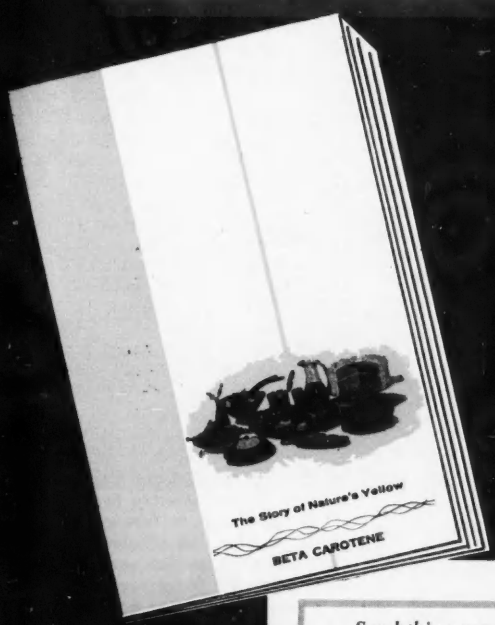

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Continuing Education Grant. A five-year, $100,000 grant has been issued to Saint Louis University and the Catholic Hospital Association by the W. K. Kellogg Foundation of Battle Creek, Michigan. The grant will be used for projection of the Association's Department of Continuing Education through the medium of formal classes for hospital department heads and supervisory personnel. Classes are scheduled to include all hospital areas, professional and service, and are designed to present the latest developments and teach new techniques applicable to any given area. Faculty for the program is being drawn from leading universities, religious communities, and business firms through the U.S. and Canada. Since September, the Association's Department of Continuing Education has given three programs — for nurse anesthetists, hospital housekeepers, and a workshop in hematology for medical technologists. The Association will continue to sponsor institutes and workshops in St. Louis and other areas to meet the needs for assistance to various hospital departments.

Courses and Workshops. February 27 to March 1 are the dates of the annual Continuation Course in Clinical Dietetics offered by the *University of Minnesota* at its Center for Continuation Study. Current topics on dietary subjects will be discussed. Further information may be obtained from the Department of Continuation Medical Education, University of Minnesota, Minneapolis 14.

A summer workshop for college teachers of foods and nutrition will be offered by the *University of Wisconsin* from June 30 through July 12. The program will emphasize educational philosophy, objectives, curricula, methodology, and evaluation as applied to modern-day teaching of foods and nutrition at the college level. Further information may be obtained from Dr. Dorothy L. Hussemann, School of Home Economics, University of Wisconsin, Madison 6.

Education for Restaurateurs. The National Restaurant Association has announced that it will sponsor a comprehensive "Executive Development Program," to take the form of a series of conferences to be held in key cities throughout the U.S. The program will be under the supervision of the Education Department. Help will be offered to management in all types of food service establishments. Travis Elliott, management consultant, has been retained to organize and prepare detailed material for these courses.

The U.S.D.A. has listed the following foods which are expected to be in plentiful supply during February:

Protein foods

Beans, blackeye and dried pinto
Filberts
Milk
Peanuts and peanut products
Pork, fresh and cured

Other foods

Apples
Corn, canned and frozen
Prunes, dried

Fats in Human Nutrition. In March of last year, a symposium on "Fats in Human Nutrition with particular attention to Fats, Cholesterol, and Atherosclerosis" was held in New Orleans. The proceedings of this symposium have now been published by the Council on Foods and Nutrition, American Medical Association. The table of contents include:

"Dietary Fat—Its Role in Nutrition and Human Requirement" — L. Emmett Holt, Jr., M.D., New York University College of Medicine

"Some Biochemical Aspects of Lipid and Lipoprotein Metabolism" — Donald S. Fredrickson, M.D., National Heart Institute, Bethesda, Maryland

"Pathological Lesions Related to Disturbances of Fat and Cholesterol Metabolism in Man"—W. Stanley Hartroft, M.D., and Wilbur A. Thomas, M.D., Washington University Medical School, St. Louis

"Dietary Control of Serum Lipids in Relation to Atherosclerosis"—Edward J. Ahrens, Jr., M.D., Jules Hirsch, M.D., William Insull, Jr., M.D., Theodore T. Tsaltas, M.D., Rolf Blomstrand, M.D., and Malcom L. Paterson, M.D., Rockefeller Institute, New York City

"Diet and the Epidemiology of Coronary Heart Disease"—Ancel Keys, Ph.D., Laboratory of Physiological Hygiene, University of Minnesota, Minneapolis

"Nutritional Studies Relating to Serum Lipids and Atherosclerosis—Therapeutic Implications" — Fredrick J. Stare, M.D., Theodore B. Van Itallie, M.D., Mary B. McCann, and Oscar W. Portman, M.D., Department of Nutrition, Harvard School of Public Health, Boston

"Fats, Cholesterol and Atherosclerosis"—a panel discussion

The symposium was co-sponsored by the Council on Foods and Nutrition of the American Medical Association, Tulane University School of Medicine, Louisiana State University School of Medicine, New Orleans Graduate Medical Assembly, and the Orleans Parish Medical Society.

New Publications. "Your Responsibility for Safety" is an eight-page leaflet prepared as a result of a year's work and field testing by the National Restaurant Association and the National Safety Council. It is a manual on safe practices for food service establishments and takes the form of a check list, divided into the various individual areas and operations in preparing and serving food, i.e., knives and food preparation, floors, china and glassware, safe clothing, chairs and tables, and so on. Copies of this booklet are being sold by the National Restaurant Association, 1530 Lake Shore Drive, Chicago 10, for 20 cents each.

"The Food You Eat and Heart Disease" is the title of a new, twelve-page leaflet released by the Public Health Service, U.S. Department of Health, Education, and Welfare. It discusses atherosclerosis and congestive heart failure and their dietary management; high blood pressure; and rheumatic heart disease specifically. The last part of the booklet is devoted to "Diet Tips for Heart Patients," stressing the need for a well balanced diet, avoidance of overeating and "trouble" foods, and the need to rest and relax after meals and to follow a diet, if the doctor has prescribed one. Copies may be ordered from the Government Printing Office, Washington 25, D.C. at a cost of $5 per 100 copies.

New U.S.D.A. Releases. "Potatoes in Popular Ways" is the title of Home and Garden Bulletin No. 55 prepared by Mary E. Kirkpatrick and Claire E. Falatko of the Human Nutrition Research Division of the U.S.D.A. This bulletin supersedes Leaflet No. 295, of the same title. The new booklet describes late- and early-crop potatoes, gives pointers on buying, storing, and cooking potatoes, and then presents a number of recipes. It may be ordered from the Superintendent of Documents, Government Printing Office, Washington 25, at a cost of 15 cents a copy.

"Poultry Grading and Inspection" has been released as Agriculture Information Bulletin No. 173. This is of timely interest, of course, with the advent of compulsory inspection of all poultry and poultry products moving in interstate or foreign commerce, which will become effective on May 1. Voluntary inspection service will remain available for processors engaged in intrastate business only. This booklet discusses the importance of the poultry industry and the need for uniform standards, as well as basic requirements of inspection and definitions and illustrations of U.S. standards for quality and grades. Pictures illustrate various grades for chickens and turkeys, as well as the inspection stamps to be used. Two pages are devoted to "Suggestions for Specifications for Institution Buying." Copies of this booklet may be purchased from the Superintendent of Documents, Washington 25, D.C., for 15 cents each.

Agricultural Outlook Charts—1958

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is a booklet of graphs and tables giving statistical information on the agricultural picture in the U.S. The subjects range from food consumption trends to land values, farm income, number of farms, consumer spending among farm families, and so on. The tables present the data from which the charts were drawn. The charts presented are available for purchase as photographic prints, positive photostats, film strips, and color slides; prices for each are given. Copies of this booklet may be requested from the Office of Information, U.S. Department of Agriculture, Washington 25, D.C.

Bulletins. A review of the literature on the cause and prevention of bacterial food poisoning has been prepared and published by William B. Esselen and Arthur S. Levin under the title, *Bacterial Food Poisoning and It's Control*—University of Massachusetts College of Agriculture Bulletin No. 493. Information on the general problem of food poisoning has been assembled with particular regard to such products as cheese, fish, meat and meat products, poultry, and ready-to-cook foods. General recommendations based on available knowledge are made which should be effective in preventing food poisoning of the common types caused by Salmonella, Staphylococci, and Streptococci. Copies of this report may be obtained from: Mailing Room, Munson Hall Annex, University of Massachusetts, Amherst.

Also from the University of Massachusetts—the Cooperative Extension Service—comes an eight-page pamphlet, "Foods . . . Facts and Fads" which is Leaflet No. 308. Compiled by Gladys Cook and May Foley, it refutes in question-and-answer form a number of well-publicized misstatements about milk, breads, vegetables, "miracle" or "wonder" foods, food supplements, reducing aids, and other nutritional topics. Requests for copies may be addressed to the authors.

From Clemson Agricultural College in South Carolina, comes a new booklet, "Recipes and Enrichment—Rice," issued as Circular 431. It provides recent information about enriched and parboiled rice, and in addition, some eighteen recipes. Directions for large-quantity preparation of enriched, parboiled and converted rices are also given. Copies may be obtained by writing the Extension Service, Clemson Agricultural College, Clemson, South Carolina.

Fund to Further Health Careers Recruitment. Announcement has been made by the National Health Council of the establishment of the Alan Gregg Fund. Contributions to this fund will be used to support the Council's Health Careers program, designed to help meet the acute shortage of qualified health personnel in the U.S. Dr. Gregg was for thirty-seven years connected with the Rockefeller Foundation, the last twenty as Chief of its Division of Medical Sciences. He was a member of the Commission on Health Careers of the National Health Council and helped to launch the program, which the fund named in his honor will now help to support.

Inplant Food Management Workshop. On February 21, *Inplant Food Management* magazine will sponsor an Inplant Food Management Workshop in Chicago. It will be the first of a series of quarterly regional workshops designed to fill the need of the inplant food management and industrial relations fields. Topics to be covered include: controlling labor costs, vending and the inplant cafeteria, and better industrial relations.

Food Service Contest. For the twelfth year, *Institutions* magazine will conduct its Annual Food Service Contest to give recognition to outstanding kitchens in restaurants, schools and colleges, hospitals, motels, railroads, steamship lines, hotels, industrial cafeterias, public institutions, military establishments, clubs, and specialty feeding operations. Judging will be done on March 4 and 5 in Chicago to select the approximately forty-five best kitchens installed recently in mass feeding facilities. The judging panel includes:

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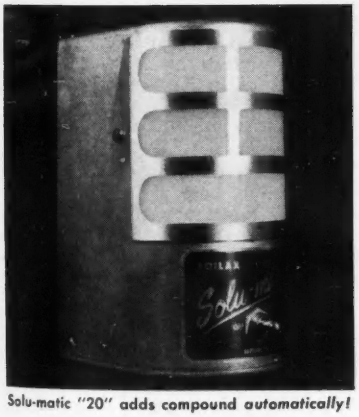

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Larry Hilaire, President, National Restaurant Association, and owner, Hilaire's Restaurants, Portland, Oregon

S. J. Casper, Jr., S. J. Casper Company, Milwaukee food service equipment and design firm

Vermont Is Brucellosis Free. An announcement by the U.S.D.A. states that Vermont has become the ninth state to be certified as brucellosis free—that is, not more than 1 per cent of Vermont's cattle and not more than 5 per cent of the state's herds have brucellosis. Other certified states are: Connecticut, Delaware, Maine, New Hampshire, North Carolina, Wisconsin, Minnesota, and Washington. More than 450 counties in 26 other states and Puerto Rico have also achieved similar status.

Poultry Inspection. On May 1, 1958, the U.S.D.A. will begin providing without cost inspection service to approved plants under the Poultry Products Inspection Act. In establishing the approximate date of May 1, the U.S.D.A. has considered the need to develop and put into effect adequate regulations, allowance of sufficient time for industry to acquaint itself fully with requirements of the legislation and regulations. Plants desiring to operate under the Act may apply at any time after January 1, 1958 and must be approved before inspection service is made available. Once a plant becomes subject to the Act, it must continue to operate under it in accordance with regulations issued by U.S.D.A.

To help those interested in producing, processing, grading, packing, and distributing poultry, the U.S.D.A. has released a new color film strip illustrating standards for quality of poultry. The strip consists of fifty-three frames and includes illustrations of the grades for stewing chickens, young chickens, fryer-roaster turkeys, young hen turkeys, and young tom turkeys. Skin and flesh bruises are illustrated with instructions on the degree of bruising permitted in ready-to-cook poultry.

The strip may also be obtained as 2 by 2 in. slides. An explanatory script accompanies each strip or set of slides. The film strip sells for $5.50; the slides for $8.15 a set. Orders may be sent to Photo Lab Inc., 3825 Georgia Avenue, N.W., Washington 11, D.C.

Lost Week-End Meals. In surveying the nutrition of teen-agers, the Idaho Agricultural Experiment Station has reported that one of the reasons for poor diets is found in skimpy week-end meals. It was found that "far more noon and evening meals were missed on week-ends than on school days. The meals which were eaten on week-ends tended to be less complete than those eaten on school days. The lower food intake at week-end meals was not made up by an increase in the amount eaten as snacks." Nearly all of the subjects ate snacks, which were generally in the form of sweets—high in calories but furnishing few of the essential vitamins and minerals.

Milk Consumption in Georgia. In its program to help producers, processors, and distributors of milk and dairy products through increased consumption of fluid milk and manufacturers' dairy products, the Georgia Experiment Station conducted a survey of 800 families with two or more persons (but not more than four boarders) which usually serve one or more meals a day at home. Dairy products to meet minimum recommended amounts (judged by U.S.D.A. accepted low-cost dietaries) were consumed by only about two-thirds of these families, although 85 per cent of the rural families consumed dairy products in recommended amounts. Significant differences were found in per capita amounts of fluid milk consumed as well as per capita

wherever you're feeding lots of food to lots of people, fast!

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EXTRA HEAVY DUTY

DISH TRUCKS

built to the specifications of the Chicago Board of Education . . .

. . . to handle easily, roll smoothly even when overloaded with dishes, silverware, refuse.
. . . to withstand the constant battering and abuse encountered in large school and college dining rooms and cafeterias.
. . . to simplify cleaning and meet rigid health standards for cleanliness.
. . . to provide maximum life usefulness with lowest possible cost to service.

The J & J Model 1462 Heavy Duty Dish Truck is ruggedly constructed with 14 gauge polished stainless steel shelves, securely welded to sturdy, highly polished, continuous stainless angle uprights. The shelves are reinforced by stainless angle, welded to the underside of each long shelf edge. It can be furnished with angle bumpers as shown or with a continuous bumper in an encircling stainless steel channel frame.

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Model 1462
Heavy Duty Dish Truck

- 14 gauge stainless steel shelves 21" x 32"
- Overall length 39½"
- Overall width 23½"
- Overall height 36"
- Equipped with two 5"-050-116 and two 2"-10-116 double ball bearing J & J casters
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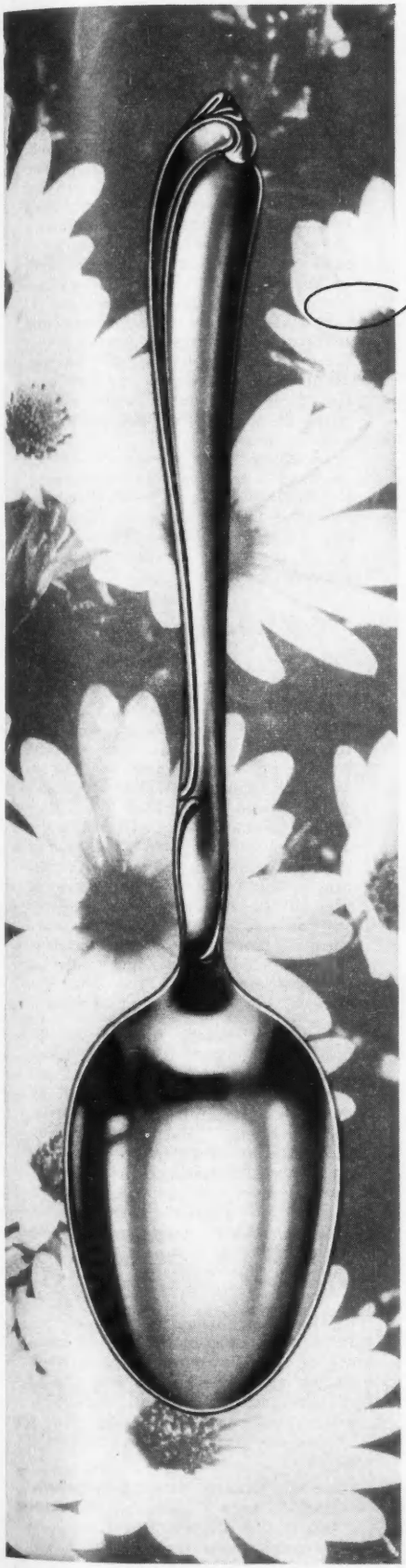

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Serve it hot. Serve it cold. And never again worry about breakage costs! The new Stanley Windsor is gleaming stainless steel inside and out. It's built to last a lifetime. The Windsor comes with a new thumb-lift hinged lid, an oversize stay-cool handle and large non-drip pouring lip. Write us today for full information. You'll be amazed at the low, low price.

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HABITANT SOUPS *now available in institutional size cans!*

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Serve your customers these deliciously different soups:

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whole milk equivalent used for the following characteristics: area, race, education, age of homemaker, age of youngest person, and income except when farmers were included in the analysis.

Approximately three-fourths of all families had used fresh fluid milk, buttermilk, Cheddar cheese, and evaporated milk during the seven-day period of the study and about half had used ice cream and butter. Dry skim milk and other dry milk products were used by about one-fourth of all the families in the survey. Fresh fluid sweet milk provided 43 per cent whole milk equivalent and buttermilk provided 21 per cent.

Approximately half of the negroes of all ages and about one-fourth of the white individuals above sixteen years did not drink fresh fluid milk as a beverage.

Details of this survey have been published as *Consumer Marketing Practices and Use of Dairy Products*, by Jessie J. Mize, Doris W. Thompson, and Frankye E. Bland—Bulletin N.S. 39, of the Georgia Agricultural Experiment Station.

News of State Associations

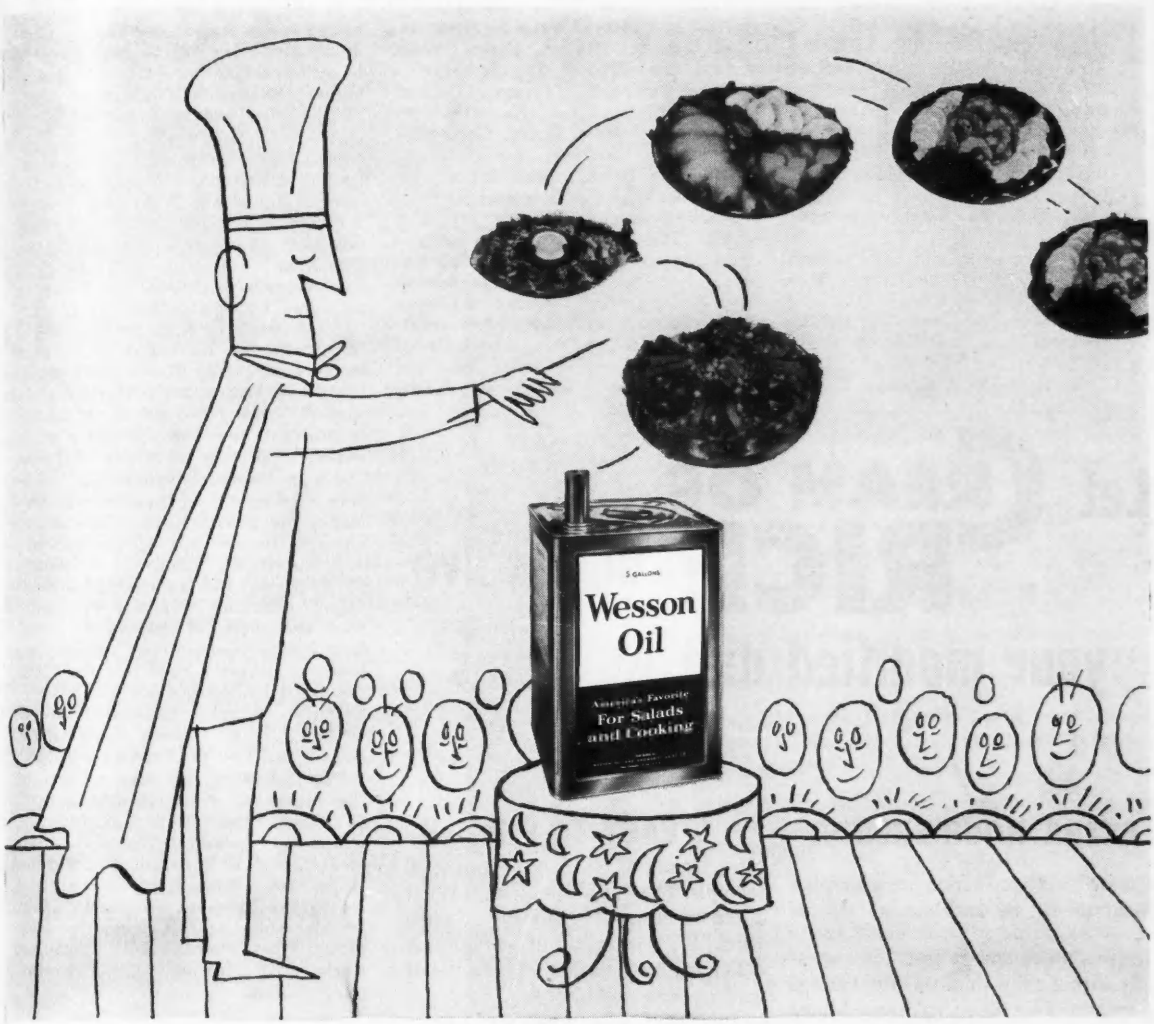
Iowa Dietetic Association. Elsie Ann Guthrie and Jean Riggs were the representatives of the Iowa Dietetic Association at a planning meeting for the 10th Annual Health Education Workshop to be held at Iowa State College, June 25 to 27. These workshops have been held to stimulate interest in health education for the people of Iowa and to assist chairmen of health committees of professional and lay organizations in performing a more efficient service. Mary Macomber also attended this planning meeting as representative of the Nutrition Service, Iowa Department of Health.

Louisiana Dietetic Association. Officers for 1957-58 of the Southwest Louisiana Dietetic Association are: President, Barbara B. Campbell, St. Patrick's Hospital, Lake Charles; Vice-President, Earline Sandefur, Lake Charles; and Secretary-Treasurer, Nancy S. Shortridge, Lake Charles. In December, the group heard a report of the annual meeting of the American School Food Service Association from the supervisor of the Calcasieu Parish School Lunch Program.

Mississippi Dietetic Association. Biloxi was the scene of the fall meeting of the Mississippi Dietetic Association on November 15 and 16. At the first session, various aspects of communications were considered on a symposium covering the following topics:

"Communications through Organization"—James T. Lee, Jr., Personnel Officer, VA Center, Biloxi

"Communications through Emotions"



You can get $700 worth of salads out of every 5-gallon can of Wesson Oil

With oil-cost-per-salad that low, why risk using a so-called "just as good" brand? It couldn't possibly equal delicate Wesson Oil—as light and fine as an oil can be.

How to cut salad costs sensibly

Don't use a cheaper oil that coarsens the flavor of your salads. *Do* use delicate Wesson Oil . . . and carefully watch the amount of dressing used per salad.

Just enough dressing makes salads taste better. And salads made with Wesson Oil dressings taste the best of all.

Rainbow Salad

Approximate yield: 32 one-cup servings

Prepare 1 quart each: shredded carrots, cooked peas, sliced onions, shredded cabbage, chopped green pepper, sliced celery, cubed American cheese and sliced cucumber.

On individual salad plates covered with lettuce cups, arrange each item in strips or mounds. Garnish with tomato wedges. Serve with basic dressing shown on 5-gallon can of Wesson Oil. About 285 calories. For Slimming Salads of this size we recommend 3 tablespoons of dressing per serving.

Vegetable Oil is no sideline with us . . .
that's why Wesson is America's largest selling brand!

The Wesson Oil People

Makers of Heavy-Duty MFB . . . Keap . . . Quik-Blend

—Dr. H. L. Deabler, Clinical Psychologist, VA Center, Biloxi

"Communications through Listening"—Jewel H. Childers, Child Welfare Supervisor, Mississippi Department of Public Welfare

"Communications through Spoken and Written Words"—Christine Drake, University Extension, University of Mississippi

Other features of the program included:

"Public Relations and Professional Advancement"—E. A. Hiller, Manager, VA Center, Biloxi

"Public Relations and Nationwide Stimulation of Dietetics as a Profession"—Helen Ger Olson, A.D.A. Public Relations Chairman

"Recent Protein Research"—Dr. Lois Almon, Mississippi Agricultural Experiment Station, State College

"Need for Protein in the Diet"—Rita Campbell, Director, Department of Nutrition, National Live Stock and Meat Board, Chicago.

Missouri Dietetic Association. On November 15, the Missouri Dietetic Association met in Kansas City, Missouri. The program opened with a panel discussion, "As Others See Us" which included as participants: a business executive, a physician, a former patient, and a nurse. Other features of the meeting were a discussion of the "Problem of the Obese Child" by Martha Wessner, Supervisor of Dietetic Service, Mead Johnson & Company; and a session devoted to "Communication—It's up to Us" by Mrs. K. Zimmerman and Schell Bodenhamer, Extension Department, University of Missouri, Columbia.

Nebraska Dietetic Association. Forty-five dietitians attended the fall convention of the Nebraska Dietetic Association on November 7. The one-day meeting featured Virginia Pinney, St. Luke's — Presbyterian Hospital, Chicago, who addressed the group on personnel administration and reorganization. Miss Pinney stressed the importance of dietitians being good co-workers, cooperative without allowing themselves to be "pushed around," and of being able to think of the interests of the institution as a whole rather than only of their own area.

At an afternoon symposium, "Factors Affecting Food Quality" were discussed by four speakers. Dr. R. E. Feeney, Department of Biochemistry and Nutrition, University of Nebraska, spoke on "Causes of Egg Deterioration." "Baking Qualities of Flour" was the topic of Professor R. M. Sandstedt. "Centralized or De-Centralized Hospital Food Service?" was discussed by Betty Jean Yapp, Chief Dietitian, Lincoln General Hospital. Cecelia Bona, Selleck Quadrangle, talked on "Use of Packaged Mixes."

The following are the officers of the Nebraska Association for 1957-58: President, Ruth Frederiksen, Community Hospital, Fremont; President-Elect, Ruth Frahm, Residence Halls for Women, University of Nebraska, Lincoln; Secretary, Sister Imelda Ann Dickrell, Memorial Hospital, West Point; and Treasurer, Barbara A. Gosling, Lutheran Hospital, Omaha.

North Dakota Dietetic Association. The North Dakota Dietetic Association this fall became affiliated with the North Dakota Hospital Association. A spring meeting in Fargo, to be held at the same time as the Hospital Association, is being anticipated.

Officers of the North Dakota Dietetic Association for 1957-58 are: President, Dorothy Revell, Fargo; President-Elect, Harriet Williams, Grand Forks; Treasurer, Beverly Greenhalgh, Minot; and Secretary, Mildred Riedesel, University of North Dakota, Grand Forks.

Ohio Dietetic Association: As their projects for the year, the Akron and Cincinnati Dietetic Associations are emphasizing career guidance.

The *Akron Dietetic Association* has purchased a print of the film, "Service of Love" and plans to show it in high schools and colleges in the area. During November, a "hospitality day" was held at Akron General Hospital, which included a tour of the dietary department for college-level students, a showing of the film, and a buffet supper. Other activities of the Akron group include a project of teaching

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EXTRA NOURISHMENT

Cream of Rice is rich in iron plus Vitamins B_1, B_2, and Niacin.

It gives quick energy fast, too. Actually within a few minutes after eating. Cream of Rice is easy to digest. Many leading pediatricians advise it.

And many doctors recommend Cream of Rice in modified diets for food allergies, ulcers, high blood pressure, intestinal distress and old-age food difficulties.

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Now Cream of Rice cooks in just 30 seconds. That's 10 times faster! What could be easier . . . quicker . . . less work! It's a meal in half a minute. A delicious, nourishing, easy-to-digest cereal young and old enjoy.

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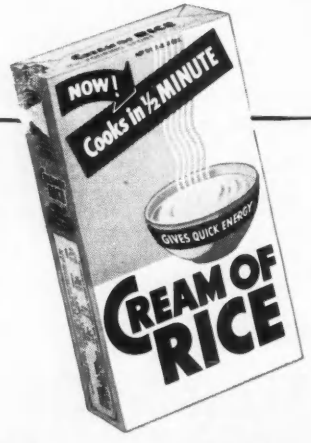
CREAMY RICE TASTE

Cream of Rice has a delicate flavor. Different, delicious. This is a creamy rice treat that really tastes good.



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Super-Mealcart. (Design Pat. Pending) (S-3010-MR Illustrated 20 Trays with Beverage Bar S-3010)

SUPER-MEALCART

Represents the latest advance in efficient portable food service equipment for centralized tray systems. The famous step-down feature (design pat. pend.) provides work surface for set-up and beverage dispensing from exclusive removable beverage bar (S-3010). Large drawers with generous clearance allow room for half-pint milk containers and full complement of dinnerware. Drawer depth in hot side permits clearance for coffee cups. Coffee is dispensed from beverage bar into pre-heated cups. Available in *mechanical refrigeration* and *cartridge type refrigeration* models.

MECHANICAL REFRIGERATION MODELS

Mechanical refrigeration with hold-over cooling capacity for a full hour *without* running compressor or blower. Will hold and retain 38° F. even in room temperature of 90° F.

S-3001-MR	(20 trays)
S-3002-MR	(24 trays)
S-3003-MR	(30 trays)

CARTRIDGE TYPE REFRIGERATION MODELS
(CARTRIDGES NOT INCLUDED)

S-3001-DP	(20 trays)
S-3002-DP	(24 trays)
S-3003-DP	(30 trays)

ONLY SHAMPAINE ELECTRIC SUPER-MEALCART HAS . . .

- **an unobstructed set-up area** *convenient* counter height, at 41″ for 20-meal cart, at 44″ for 24-meal cart. Accommodates large trays up to 15½″ x 20½″.
- **all stainless steel, double-walled, fully-insulated construction throughout.** 2½″ insulation between hot and cold compartment.
- **compact heated drawers** accommodating three 9″ dinner plates, *plus* three 5½″ plates, *plus* three coffee or tea cups
- **an oven compartment** with internal, waterproof installed, stainless steel, sheathed sealed heaters. Accessible *without* dismantling or turning cart upside down. Provides uniform temperatures (185° F.) throughout compartment.
- **fully-insulated, recessed and double-walled doors** of oven compartment close tightly against recessed frame. Full-length *stainless steel* piano hinges on doors.
- **rugged, compact tray slides** that can be removed in easy to clean *sections*, providing clearance between tray slides of 3¾″ for ½ pint "carton-type" milk container.
- **models in 20, 24 and *30-meal size,** for both *mechanical* and *eutectic* refrigeration (Dole cartridge), and with or without beverage dispensers.

*at additional set-up charge.

S-3010 Beverage Dispenser
(Cart Not Included)

REMOVABLE BEVERAGE BAR S-3010

Removable, easy to load, easy to clean beverage bar **with *separate*, individually insulated wells permitting dispensing of boiling water from one and cooled drinks from the other. Bar can be used in combination with utility truck for "between-meal" coffee or fruit juice servings to patients or can be set up in Doctors Lounge.**

Electric, three well—each well individually thermostatically controlled, stainless steel.

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THE COMPLETE FOOD CONVEYOR LINE

50 Webster Ave. • New Rochelle, N. Y.

normal nutrition to school teachers and parents, the development of a unified diet manual for the city, and the collecting of quantity recipes from Akron hospitals. A special committee has been formed for the purpose of persuading suppliers to produce such products as watered ices, salt-free butter patties, and skim milk in half-pint containers.

Activities for the year in the *Cincinnati Dietetic Association* began during the summer when plans were begun for its career guidance program. At the first planning meeting, forty-five members participated in a brain-storming session. The members were divided into two small groups, one of which considered ideas for using the film, "Service of Love" and the other methods and techniques for recruiting persons for dietetics. Some thirty ideas were produced during an hour's period. After the meeting, members were divided into eight working divisions to continue during the year, each division concentrating on several of the more feasible ideas produced during the brain-storming session.

Oklahoma Dietetic Association. On November 9, the Oklahoma Association met at the University of Oklahoma Campus, Norman. Feature speaker of the occasion, following business reports, was Dr. Charlyce King, who is teaching guidance and counciling on the University campus. Her subject was "How to Kill an Organization."

Rhode Island Dietetic Association. Rhode Island dietitians this year are focusing their efforts on career guidance. One of the most important aspects of this project has been the establishment of a $100 scholarship, which will be awarded for the first time this spring. Spot radio announcements have been tape recorded for use by local stations in the state, and open houses for high school students are planned at the University of Rhode Island and at several hospitals. In addition, a joint program for career guidance, co-sponsored with the Rhode Island Home Economics Association, the Nutrition Council of Rhode Island, and the Rhode Island Dietetic Association, will be conducted this spring.

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Association Activities

Committee to Study Broadening of A.D.A. Membership. The Committee to Study Broadening of A.D.A. Membership met in Chicago on January 17 and 18 to discuss further committee activities. Details of the past year's progress appear in the *1956-1957 Annual Reports & Proceedings*, which each member will receive in February.

Executive Board and Coordinating Cabinet Meetings. The A.D.A. Executive Board will meet in Chicago, February 18 to 20. The Finance Committee and Council of the House of Delegates will hold their meeting on February 21. The Coordinating Cabinet will also meet in Chicago, on February 22.

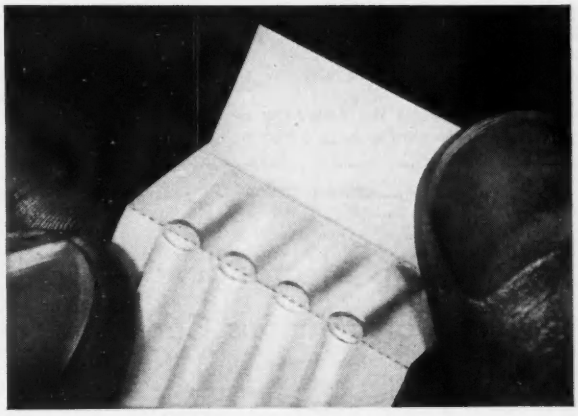
Council of National Organizations. Ruth M. Yakel represented the Association at the Annual Meeting of the Council of National Organizations of the Adult Education Association held in New York City, December 12 and 13, 1957. The main objectives of the CNO are: "to develop better understanding of the educational function of organizations and to improve ways of achieving educational objectives; to develop a climate favorable to participation in adult education; and to increase the leadership of national organizations in the adult education field."

Programming of the meeting was primarily of the workshop type, with the subjects discussed related to past achievements and future objectives of the CNO. Some fifty other national organizations were also represented.

The CNO has recently published two booklets which may be of interest to members: *TV—Learning to Use It* (price 50 cents a copy) and *Ten Check-points for Better Booklets* (60 cents a copy). Both may be ordered from CNO, Hotel Shelburne, 303 Lexington Avenue, New York 16.

New Diamond Crystal Seasoning Packets cut serving time and costs!

1. Exclusive fluted construction is completely moisture resistant.



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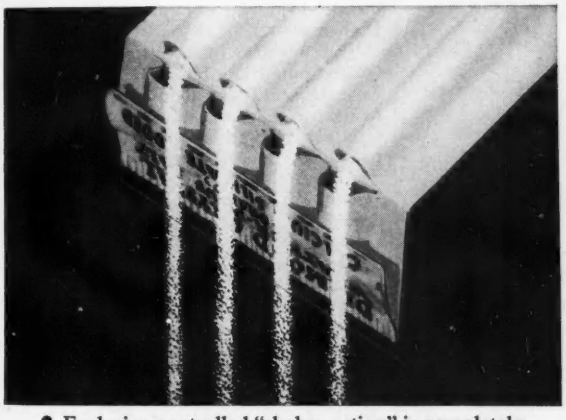
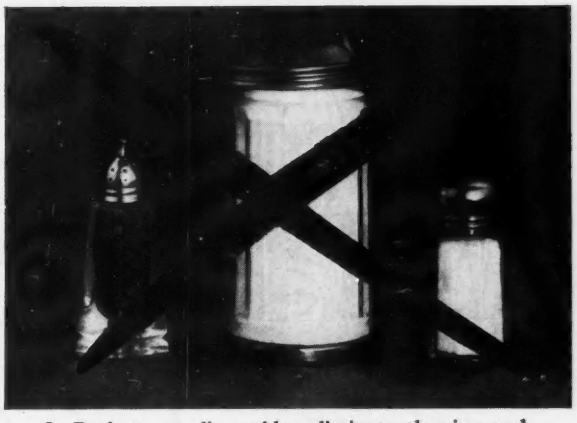
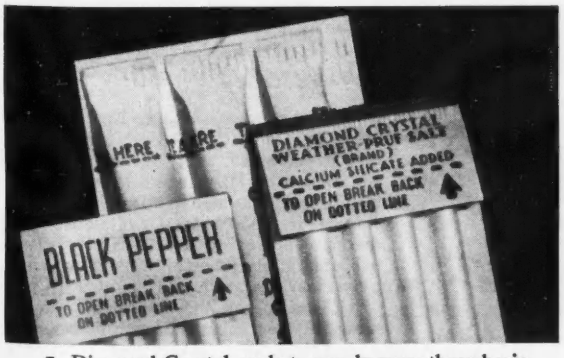


3. Exclusive controlled "shaker action" is completely unlike messy, ordinary tear-and-pour containers. The patented Diamond Crystal packet actually lets you *shake on* the seasonings.



4. Packets are disposable—eliminate cleaning and servicing costs of old-fashioned dispensers.



5. Diamond Crystal packets supply your three basic seasonings—pure ground black pepper, sparkling Diamond Crystal Salt, and refined sugar.

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Sirs: Please send me a free sample box of your new seasoning packets.

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Curriculum Conferences. The National League for Nursing is sponsoring eleven regional curriculum conferences for nursing education. The objectives of the conference are, in part: to assist instructors in re-examining their concepts of good nursing care; to assist instructors in planning effective learning experiences for good nursing care; and to provide impetus for schools to plan on local, state, and regional bases for improved curriculum. The first conferences will be concerned with the diploma and associate degree programs.

A.D.A. will send the following representatives to conferences being held in January and February: Vera P. Peterson, from the University of Oklahoma Medical Center, for the meeting in Oklahoma City, January 15 to 17; Helen MacLachlan, Duke University Hospital, for the meeting in Williamsburg, Virginia, January 21 to 23; Arlene Payne, University of Kansas Medical Center, for the meetin Kansas City, Missouri, February 4 to 6; and Dorothy J. Galbreath, Marquette University, for the meeting in Minneapolis, February 17 to 19.

Conference on the Aged. Margaret Dunham, Indiana Board of Health, as A.D.A. representative, will attend the U.S. Public Health Service's National Conference on Nursing Homes and Homes for the Aged in Washington, D.C., February 25 to 28.

WHO. The 5th Annual Meeting of the National Citizens Committee for the World Health Organization was held in Cleveland, November 13, 1957. Marquerite J. Queneau, New York State Department of Health, represented our Association.

Dr. Leroy E. Burney, Surgeon General, Public Health Service, and Chairman, U.S. delegation to 10th World Health Assembly, gave the keynote address.

Dr. Thomas Parran, Dean, Graduate School of Public Health, University of Pittsburgh; Dr. H. van Zile Hyde, Chief, Division of International Health, Public Health Service; and Dr. Malcolm H. Merrill, Director, California Department of Public Health, participated in the forum discussion "Inside Russia—What Is Public Health Now Like?" These experts reported as members of a U.S. mission which visited the Soviet Union this summer.

The 1958 World Health Assembly is to be held in the United States in Minneapolis, May 26 to June 14. Bringing the Assembly to the United States in 1958 has been a major objective of the Committee for more than a year.

The purpose of the National Citizens Committee for WHO is to inform U.S. citizens about international health problems, the work of WHO and other agencies in solving these problems, and its importance to our people. Eighty-eight nations have now joined WHO. A.D.A. is one of the sponsoring and participating organizations belonging to this Committee.

We, as U.S. citizens, as well as dietitians, have an opportunity to become individual members of the Citizens Committee of WHO, since membership is open to both individuals and organizations wishing to show interest and support for international health and to help in the Committees' purpose. Four classes of individual membership were established last year: active member, $5; contributing member, $10; sustaining member, $25; and patron, $100 or more. Committee headquarters are situated at 1790 Broadway, New York 19.

Obituary

Jane Anderson Walch. The A.D.A. office has been notified of the death on November 25, 1957, of Jane Anderson Walch of Milwaukee. Mrs. Walch first became a member of the Association in 1936, after completing a dietetic internship at the University of Michigan Hospital and was employed on the staff of Granview Hospital, LaCrosse, Wisconsin. She later resigned her membership to become a full-time homemaker, but renewed her membership in 1955, after taking additional college work at Mount Mary College, Milwaukee. For the

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SERVE UNIFORM PORTIONS *in*

HALL
Secret Process
FIREPROOF CHINA
AVAILABLE IN 26 BEAUTIFUL COLORS

Hall Baking Dishes make portion control automatic. The capacity of the dish assures uniform servings of the desired size — no need to depend upon the server's skill. Hall ware also gives the chef an opportunity to prepare economical recipes which make profitable menu attractions. Write for Bulletin SM-1.

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The World's Largest Manufacturer of Fireproof Cooking China

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FLUTED BAKING DISH
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AN ADDED SECRET TO THE SECRET PROCESS
HALL CHINA METAL-CLAD...by PLATECRAFT®
Secret Process **HALL CHINA** plated with lustrous nickel-chrome by a secret process.
Write for Bulletin MC-65

H-9

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40 gallon Tilting Kettle

Wall Mounted Cooking Kettles Give You More!

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After more than 5 years of field testing, Hubbert engineers are convinced that Wall-Mounted stainless steel kettles provide definite advantages in kitchen sanitation, ease of servicing and economy of maintenance.

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past four and a half years she had served as a part-time dietitian at Milwaukee County Institutions.

News of Products and Services

Following release of a report by the U.S.D.A. that 20 to 25 per cent of American households have less than the recommended intake of thiamine and riboflavin, *Merck & Co.* has launched a campaign to increase consumer awareness of the high nutritional value of enriched products. A story kit, designed for high school level, consists of a twelve-page teacher's manual, wall chart, and student booklets which stress the importance of enriched flour, bakery and cereal products. The teacher's manual carries a number of suggested projects, while the student booklet serves as a supplement, outlining the history of breadmaking to the present day. Suggestions for the lunch box and tips on proper packing are listed. A four-color wall chart shows the four food groups—bread and cereals, meat, fruit and vegetables, and milk—required for nutritionally balanced meals.

Gerber's Baby Foods have added strained orange pineapple and strained pineapple-grapefruit beverages to the Gerber baby food line. Each product contains ascorbic acid. Both are mildly sweet, never tart, and are packed in 4¼-oz. cans. For "snack break for tots," right after the afternoon nap, it is suggested that orange juice and apple juice be alternated for variety and wider acceptance of food flavors.

The American Institute of Baking is offering the fourth edition of its booklet, "Eat and Grow Slim." Balancing calories to lose weight is simple arithmetic, it points out. For each pound to be lost, shave 500 calories from the daily quota and limit weight loss to 2 lb. a week. All the proteins, vitamins, and minerals needed for an adequate diet can be met by a 1500-calorie-a-day diet, by sane food selection, checking portions, refusing snacks. Other "Take-off Tactics" are listed. Suggested menus for a week are given. Exercise is advocated, at least a good, brisk walk of six to eight blocks every day for a starting point. One page shows the number of calories lost per minute during varied activities. A personal record sheet is provided in this thirty-three-page booklet. The nutritional statements made have been reviewed by the Council on Foods and Nutrition of the American Medical Association and are said to be consistent with current authoritative medical opinion.

The Institutional Service of *Armour and Company* has developed a new 50-serving recipe for "special Hungarian goulash," to tie in with promotions this month featuring Sauerkraut Week. Copies of the recipe, with photograph, are available on request.

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